DOCUMENT RESUME

ED 310 584 EC 220 788

AUTHOR	McCormick, Sandra; Cooper, John O.
TITLE	Investigation of a Study Technique To Increase Learning Disabled Students' Reading Comprehension of Expository Text. Final Report.
INSTITUTION	Ohio State Univ., Columbus. Research Foundation.
SPONS AGENCY	Special Education Programs (ED/OSERS), Washington, DC.
PUB DATE	Nov 88
GRANT	G008530194
NOTE	103p.
PUB TYPE	Reports - Research/Technical (143)
EDRS PRICE	MF01/PC05 Plus Postage.
DESCRIPTORS	Difficulty Level; High Schools; *Instructional Effectiveness; *Learning Disabilities; *Reading Comprehension; *Reading Instruction; Recall (Psychology); *Study Skills; Teaching Methods
IDENTIFIERS	*SQ3R Study Formula

ABSTRACT

The study reported in this paper investigated the effects of a frequently recommended study technique on the comprehension of expository text by high-school students having learning disabilities. The instructional procedure studied was "Survey, Question, Read, Recite, Review" (SQ3R). Six experiments were conducted over a 3-year period, involving a total of 49 students. Data for the six experiments were analyzed through use of single-case experimental designs. General procedures for all experiments consisted of students retelling information after reading passages from history texts. Variables in the six studies included length of reading passage, reading level of passages, teacher prompts, and reading time limits. Results of the experiments showed that the SQ3R procedure had little effect on students' recall of information. There was, however, a clear functional relationship between the length of passages used and recall of information, favoring passages of shorter length. (Author/JDD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED310584

RF Project 765043/719898
Final Report

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☒ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

INVESTIGATION OF A STUDY TECHNIQUE TO INCREASE LEARNING DISABLED STUDENTS' READING COMPREHENSION OF EXPOSITORY TEXT

Sandra McCormick and John O. Cooper
Department of Human Services Education

U.S. DEPARTMENT OF EDUCATION
Office Of Special Education Programs
Washington, D.C. 20202

Grant No. G008530194

November 1988

The Ohio State University
Research Foundation
1314 Kinnear Road
Columbus, Ohio 43212

EC 221708

BEST COPY AVAILABLE

FINAL REPORT

for

Investigation of A Study Technique to Increase Learning Disabled Students' Reading Comprehension of Expository Text

Prepared by:

Sandra McCormick and John O. Cooper, The Ohio State University, Columbus, Ohio, 1988.

Funded by: The United States Department of Education, Office of Special Education Programs (Grant No. G008530194).

Abstract

This study investigated effects of a frequently recommended study technique, SQ3R, on the comprehension of expository text by high school students having learning disabilities. Six experiments were conducted with each experiment examining slightly different variables. Results of the experiments showed that the SQ3R procedure had little effect on students recall of information. There was, however, a clear functional relationship between the length of passages used and recall of information, favoring passages of shorter length.

FINAL REPORT

for

Investigation of A Study Technique to Increase Learning Disabled Students' Reading Comprehension of Expository Text

Prepared by:

Sandra McCormick and John O. Cooper,

The Ohio State University, Columbus, Ohio, 1988.

Funded by:

The United States Department of Education, Office of Special Education Programs (Grant No. G8008530194).

This Final Report consists of the following information and sections: (a) Rationale and Background for the Present Research; (b) Original Project Objectives; (c) Overview of the Studies Conducted during the Project; (d) General Procedures for All Experiments; (e) Experiment 1; (f) Experiment 2; (g) Experiment 3; (h) Experiment 4; (i) Experiment 5; (j) Experiment 6; (k) Summary of Findings and Conclusions; (l) Limitations; (m) Dissemination Efforts; (n) References; and (o) Appendices.

RATIONALE AND BACKGROUND FOR THE PRESENT RESEARCH

Special education services may be provided for any of the seven academic areas specified in the federal definition for learning disabilities (i.e., listening, thinking, speaking, reading, writing, spelling, or doing mathematical calculations). Yet, if one asks tutors, teachers, supervisors, and administrators in the schools to specify the academic area for which the majority of students are referred to programs for the learning disabled, the answer is invariably for reading difficulties. In 1982, 73% of the Individualized Education Programs (IEP's) for students with learning disabilities were written for the area of reading (Schiffman, 1982). Recently, Ip (1986) found that in a large metropolitan school system's learning disabilities classrooms 96% of primary children, 90% of intermediate children, 92% of middle school students, and 91% of senior high school students enrolled in these classes had reading problems. Nonschool service providers also have noted the same occurrence. For example, the Learning Disabilities clinic, Children's Hospital Medical Center, Boston, reported that about 75% of their referrals are because the student has a reading disability (Chall, 1978).

As documented by Ip (1986), reading disabilities are not limited to elementary level learning disabilities classrooms; they persist as the major academic problem in secondary school programs as well. Comprehension problems in particular are intensified and widespread at the secondary school level. Ip found that 84% of senior high students with learning disabilities had comprehension difficulties. Even though word identification problems may still exist at upper grade levels, factors in

text materials such as sentence complexity and requirements for abstract reasoning place greater demands on reading comprehension skills of secondary students (Harris & Sipay, 1980). Dual instructional goals are another consideration for students with learning disabilities at the secondary level. Not only must the basic reading areas (e.g., word recognition, comprehension skills) be treated, students must also be helped to adapt to the reading requisites of the regular classroom and to postsecondary activities. Assignments in regular classrooms at the secondary level require "study-type" reading, neccessitating thorough comprehension of material. In addition, assignments in secondary classrooms require the reading of expository material. Expository material (i.e., informational material designed to explain) constitutes the major portions of all content area texts with which students must contend (McCormick, 1987). Another expectation at the secondary level is that reading assignments be carried out independently in study halls or as a homework task. Postsecondary reading demands also require independent reading activity (e.g., reading a job manual, studying for a college course).

One instructional procedure, called SQ3R, seemed to meet the conditions described above since it is designed to increase comprehension and recall of expository material by teaching students an independent study technique. Developed in 1941 by Francis P. Robinson, SQ3R (or SQRRR) stands for the following.

Survey - To survey means to scan titles, subtitles, and illustrative material (e.g., maps, pictures, graphs). Surveying is used to provide readers with a mental set to prepare them for the information to be read.

Question - To question, in this case, refers to changing titles and subtitles into questions. This conversion is to be accomplished by the students, not the teacher. For example, if a subheading says "Farm Products of Nebraska," the student might ask the question "What are the farm products of Nebraska?"

Read - To read means just what it always does, but because of the two former steps and since the student is anticipating the next R, reading should be a more active process than is often found when students are studying expository material.

Recite - To recite indicates that the student is to answer the questions posed in step 2. This can be accomplished either through silent mental rehearsal, by writing the answers, or by oral recitation.

Review - To review the material means to answer the questions in step 2 again after an appropriate lapse of time. The review step is considered important since spaced practice promotes retention (McCormick, 1987, p. 356).

SQ3R has been widely advocated for 40 years by psychologists and reading authorities. Harris (1968), for example, suggested SQ3R to promote assimilative reading (i.e., to absorb and remember the content). Grob (1970) advised that SQ3R be used to counteract slow reading rates because an effective study method can decrease work-time demands for students who characteristically approach reading assignments in a haphazard manner. SQ3R has been recommended by numerous authors of texts used in teacher education programs (e.g., Alley & Deshler, 1979; Brown, 1982; Ekwall & Shanker, 1983; Heilman, Blair, & Rupley, 1986; Sargent, Huus, & Andersen, 1970; Tinker & McCullough, 1968; Viox, 1968), and in many journal articles

(e.g., Alexander, 1985; Beers, 1986; Fodim, 1986; Pauk, 1965; Tadlock, 1978).

Tadlock (1978) delineated the rationale for each step of SQ3R based on an information processing theory of learning, but, Harris (1968) noted that although "this system seems to be well grounded in the experimental psychology of learning,...[it] has not been subjected to much experimentation" (p. 209). Indeed, Johns and McNamara (1980) have described the SQ3R technique as "a forgotten research target" (p. 705). Robinson (1946), the developer of SQ3R, did report a study of the method, but provided no information concerning experimental procedures, giving only pretraining - postraining results. The research that does exist is conflicting and, in some cases, has serious methodological flaws. Research on SQ3R is summarized in Table 1.

Several authors have identified methodological problems in the SQ3R research. These problems include: (a) lack of control for equal amounts of time on task for the constrasting methods (Harris & Sipay, 1980; Johns & McNamara, 1980); (b) no control to ensure that students really employed the techniques (Gurrola, 1975); and (c) lack of attempt to ensure that students understood how to carry out each element of SQ3R (Wooster, 1958). These deficiencies preclude confidence in this body of research. However, results also seem somewhat inconclusive for the SQ3R research in which the above identified methodological problems were controlled. For example, the SQ3R method produced better results on short answer tests but not on retelling measures in the Adams, Carnine and Gersten (1982) research, but the opposite effect was found in the Alexander (1985) study. The purpose of the presesnt research was to conduct adequately controlled experimentation to test the efficacy of this tecnnique with participants

Table 1

A Summary of Research Related to SQ3R

Researchers	Focus	Grade	Analysis	Results
Adams, Carnine, & Gersten (1982)	Compared SQ3R with teacher feedback and no instruction	Fifth graders	Analyzed results of a short-answer test and retelling protocols	SQ3R group did significantly better on short-answer tests but not on retelling measures
Alexander (1985)	Compared SQ3R in a direct instruction format with a traditional approach to content area instruction, working with students individually	Intermediate grade LD students	Analyzed results from short-answer tests and retelling protocals	Functional relationship demonstrated between SQ3R and scores on retelling protocals, but not short-answer tests
Darch, Carnine & Kameenui (1986)	SQ3R contrasted with a graphic organizer strategy and a directed reading method	Sixth graders	Results of experimenter-developed tests analyzed	SQ3R and the graphic organizer strategy transferred to new materials better than the directed strategy
Diggs (1973)	Three methods investigated: SQ3R, a mechanized approach, and a combination method	College	Analyzed results of informal and standardized tests in three subject areas	No statistically significant differences
Donald (1967)	Constrasted social studies instruction with SQ3R versus instruction with no special guidance	Seventh graders	Pretest-postest results compared for standardized and teacher-designed social studies tests	No difference on standardized tests, but significant differences on teacher-made tests in favor of SQ3R

Table 1 (continued)

Douge (1983)	Same as Alexander (1985) except working with students in small groups	Intermediate grade LD students	Analyzed results from retelling protocols	Functional relationship between scores on retelling protocols and SQ3R
Gurrola (1975)	Attempted to determine which components of SQ3R were most helpful. Examined: (a)Question/read, (b)Survey/question/read, (c) Survey/question/read/recite	College	Analyzed results from teacher-designed instruments	Use of a combination of four elements (i.e., # c) produced the best results
Wilmore (1966)	Contrasted four methods for studying textbooks: (a)SQ3R, (b) outlining, (c) reading only, (d) underlining	College	Two-hour study sessions with each method, followed by objective questions; questions re-administered 2 weeks later to test recall	Underlining was the best method; SQ3R was next most helpful
Wooster (1958)	Assignments compared with and without use of SQ3R	College	Analyzed scores from teacher-prepared tests	No differences found

for whom SQ3R seemed to hold promise. Since students with learning disabilities were the target of the present research it was particularly heartening to note the positive results in the two studies employing persons with learning disabilities (see Table 1). However, these studies and all others, except one, in which methodological flaws were not identified had elementary students as participants, and reading task requirements are somewhat different at that level than those for secondary students. One well-designed study that was conducted with older subjects investigated the method with college students, and in that study SQ3R proved to be only the second best of four methods of instruction (Wilmore, 1966). These factors and the somewhat contradictory results of previous studies led to the conclusion that there are many unanswered questions before SQ3R warrants recommendation. Our research was designed to provide more indepth understanding about whether SQ3R is a helpful technique for secondary students with learning disabilities.

ORIGINAL PROJECT OBJECTIVES

The procedural objectives of the original proposal called for a series of experimental analyses of the study technique called SQ3R with secondary level learners with learning disabilities in reading. Six studies were proposed for a 3 - year project. Study 1 was a replication of the Alexander (1985) and Douge (1983) experiments that had shown functional relationships between the introduction of the SQ3R technique and reading comprehension of elementary pupils. Studies 2 through 6 were to be concerned with an analysis of the elements of SQ3R and the application of those procedures in secondary classrooms. The latter five studies in the original proposal were contingent on a successful replication of the

Alexander and Douge experiments to be conducted with secondary students in the first study. If their experiments could not be replicted with secondary students, then it was propsed to continue to analyze and modify SQ3R independent variables in other systematic replications of Alexander and Douge until the original purpose of the proposal was met. As will be shown, we were unable to replicate the findings reported by Alexander and Douge in our first study. Therefore, the objectives focused on identifying robust variables to be added to or to find variations of the SQ3R technique for secondary students with learning handicaps in reading.

OVERVIEW OF ACCOMPLISHMENTS

This section serves as a summary of the six experiments conducted over the 3-year period during which this project was funded. The six sections which follow the Overview of Accomplishments section provide detailed information about each of the six studies.

Data for the six experiments were analyzed through use of single-case experimental designs. General procedures for all experiments consisted of students retelling information after reading passages from history texts. Percentages of retelling were computed from the number of information units told by students and the total number of information units contained in a passage. Interrater agreement measures were taken for both the dependent and independent variables. Each experiment lasted approximately 10 weeks. Different subjects were used in each experiment, all classified as learning disabled according to State of Ohio criteria.

In Study 1, 9 students, ages 16 to 18, with reading levels of 6.5 to 7.5, were taught in groups of 3 with different teachers assigned to each group. Passages of 1,000 words at the seventh-grade reading level were

read. During the baseline conditions students were told to read and study the best way they knew how. During intervention the SQ3R procedure was practiced under direct teacher supervision. Time was held constant across the instructional portion of the conditions, but students were given an unlimited amount of time in the individually-administered retelling sessions. Results examined in the context of an A-B-A-B design showed the SQ3R procedure had no effect on participants recall of information.

Ten learners participated in Study 2, ages 15 to 17 and reading at levels 7.1 to 8.1. Data were analyzed for three conditions, all employing SQ3R, using an alternating treatments design. The baseline condition was the same as the intervention condition in Study 1. Intervention condition 1 in Study 2 was the same as baseline except students read 300-word passages and time was decreased for reading these shorter selections. Intervention condition 2 was the same as intervention condition 1 except the teachers used a procedure to prompt the occurrence of all information units during the Recite period of the SQ3R technique and the Review procedure for SQ3R was eliminated. Results demonstrated a clear functional relationship between the length of the passages and number of information units retold, favoring the shorter passages. However, elaborated recitations had no effect and the review procedure was not functionally related to increases in retelling.

Because SQ3R was employed in all conditions in Study 2, Study 3 next addressed the question of whether students would recall more information from the shorter 300-word passages when using SQ3R than when not using this procedure. Nine students, ages 15 to 17, reading at levels 6.2 to 8.5, participated. Procedures were identical to Study 1. Data collected within the context of an A-B-A-B design showed that percentages of retelling

increased for only 3 of the participants after the SQ3R procedure was introduced.

Since there was a lack of effect for SQ3R in the preceding studies, Study 4 investigated a modification of SQ3R in which schemata statements, similar to a preview procedure, were presented by the teachers in place of the Survey step and predictions were required of students rather than employing the Question procedure. All other steps were identical to Study 1 except 300-word passages were read. An A-B-A-B design was used. For the 9 students who participated, ages 14 to 17, reading at 7.7 to 8.6 grade levels, this modification produced no effects greater than those seen in baseline.

In the first four studies, materials were used which were approximately at the students' reading levels. Since no substantive effects were found after use of SQ3R, Study 5 asked the question of whether SQ3R would be efficacious if the material was difficult for the student. Passages, 300-words in length and at seventh grade reading level, were used with 6 subjects, ages 15 to 17, who were reading at approximately fifth grade level (range = 5.4 to 6.3). All other procedures were identical to Study 1. Using an A-B-A-B design, data showed increased comprehension with the SQ3R condition for 5 of the students but did not reverse during the baseline 2 condition in which they were told to simply read and study the best way they knew how. During the baseline 2 period the experimenters observed the students independently using the SQ3R procedure they had experienced in the previous condition even though they were not directed to do so. Although this seemed to bode well for transfer of use of the SQ3R procedure, the strength of the treatment could not be verified since no reversal in retelling performance was seen. Therefore, Study 6 was planned

to examine the same question in the context of a research design which avoids the problem of transfer of effect.

In Study 6, six students participated, ages 16 to 17. Three of the students were reading at fifth grade level (range = 5.0 to 5.7) and 3 at seventh grade level (range = 7.0 to 7.6). Data were analyzed within a multiple baseline design. Procedures were identical to those in Study 1 except 300-word passages were used. Analysis of scores for both those students reading at fifth grade level and those reading at seventh grade level showed no differences in performance between the baseline condition and the SQ3R condition.

Based on these investigations no support for use of SQ3R can be offered for the population adressed in this study.

GENERAL PROCEDURES FOR ALL EXPERIMENTS

For all experiments the dependent variable was students' retelling of information obtained by reading passages from current history textbooks. The passages were written at seventh-grade reading level. Reading levels of text were computed using the Fry Readability Formula (Fry, 1977). During 4 school days each week, students were asked to read a different passage each day and after each retell as much information as they could recall from the selection. The students' retelling responses were recorded on audiotape. The tapes were scored and results were reported as percentages of retelling. Percentages of retelling were computed from the number of information units given by the students and the total number of information units contained in the passage.

An information unit was defined as a sentence, a subject-verb-object

relationship or an implied subject-verb-object relationship. Dates or names were considered information units by themselves. Master protocols of information units were developed for each selected passage using procedures similar to those reported by Adams, Carnine, and Gersten (1982). They were:

1. Passages were transcribed from current history textbooks.

2. Two Graduate Research Assistants independently outlined each passage.

3. Outlined passages were examined to insure a minimum of four subheads. The number of subheads ranged from 4 to 7.

4. The outlines were compared and any information included on both outlines was included in a master outline.

5. The master outlines were used for recording the number of information units retold by the participants.

Interrater Agreement

Dependent variable. Teachers of each of the groups of students with whom the experiments were conducted scored all of their students' retellings each session by listening to the audiotape of the session. In addition, an independent rater, who was a Graduate Research Assistant not serving as a teacher, rescored the audiotape retellings of students each session, rescoring one student from each of the instructional groups. The choice of which students to be scored each day by the independent rater was determined in advance by reference to a table of random numbers. The independent rater then gave her scoring of the retellings to a third person who calculated a percentage of agreement based on the independent rater's scorings and the teacher's original scorings.

Interrater agreement was calculated on an information unit-by-information unit basis for overall agreement by dividing the number of agreements by the number of agreements plus disagreements multiplied by 100.

Independent variable. To increase the liklihood of the integrity of the independent variable, each session's audiotapes of the teachers' lessons were monitored for adherence to and deviations from the prescribed baseline and SQ3R procedures. Monitoring was maintained through the following procedures.

1. Procedural checklists were derived from an outline of the baseline and SQ3R procedures.

2. An independent observer listened to one of the teachers each session. The choice of teacher varied based on selection with a table of random numbers. As the observer listened to the audiotape, the checklist was referred to and the outline checked off in accordancae with the teacher's behaviors.

3. Written feedback was given to the teachers concerning the integrity of their procedures. On the few occasions when minor deviations occurred, one of the research directors met with the teacher to review the exact specified procedures.

Results for all experiments. Across the six experiments, 183 interrater agreement scores for the dependent variable were calculated for baseline conditions and 139 for the intervention conditions. The mean baseline condition agreement was 89.3%; the mean intervention condition agreement was 87.6%.

For the independent variable, consistency of implementation with the planned procedures was assessed for 75 baseline condition sessions and 70 intervention condition sessions. Consistency of implementation for

baseline was 96.4% and 97.6% for intervention.

EXPERIMENT 1

Method

Students and setting. Nine students selected from the student population at a state rehabilitation center for adjudicated delinquent male youth served as participants. They ranged in age from 16 to 18 years. Seven of the students were Caucasian; two were Black. Selection criterion required a demonstrated reading deficiency of a minimum of two grade levels below actual grade placement. The students read at a grade level between 6.5 and 7.5. All were classified as learning disabled according to State of Ohio criteria which specifies that students have a discrepancy score of two standard deviations or greater between intellectual ability and achievement and that this decision be based on a multifactored evaluation.

All sessions were held within the school buildings on the center's campus. The students received instruction during small group sessions. There were 3 groups of 3 students with a different teacher assigned to each group. The specific rooms used during the study were an unused classroom, an audiovisual instruction center, and a small staff meeting room.

General procedures for baseline and SQ3R conditions. The following procedures remained consistent during baseline and SQ3R phases of the study. Data were examined within the context of a multiple baseline across subjects design (Baer, Wolf, & Risley, 1968).

1. Passage Selection: Passages for each session were selected randomly from the previously prepared passages. They were approximately 1,000 words in length (range = 900 - 1,100 words).

2. Word Preview: Three words judged to be difficult for the reading level of the assigned passages were presented to the students on 3" x 5" flashcards. To select these, two research assistants independently prepared a list of words they considered to be difficult for that reading level. The two independently-prepared lists were then compared and three words appearing on both lists were selected for presentation. Students were called upon, in turn, to pronounce each word. If the word was incorrectly pronounced or not attempted, the teacher modeled the correct pronunciation of the word. The word was defined and used in a sentence by the teacher after it was correctly pronounced by the student.

3. Order of Retelling: A card showing the order in which students were called upon to retell was displayed in clear view for the students. The ordering was arranged to give each student the same opportunity to be first, second, or third to retell.

4. Retelling: Retelling responses of individual students were audiotaped. Students waiting for their turn to retell were prevented from hearing the retellings of others by wearing headphones and listening to comtemporary rock music. In addition they were provided a wide variety of magazines to read before and after retelling.

The procedure for retelling started with the teacher saying, "Tell me everything you can remember reading. I won't interrupt so tell as much as you can before you stop. Remember that you'll get a point for every important detail you can tell. You can begin now." When the student stopped the teacher said, "Can you think of anything else?" If the student indicated affirmatively he was asked to continue. If he answered "No" he was dismissed to return to the music tapes and magazines. Students were only prompted once to try additional recall of information.

5. Feedback: A point system was used during both baseline and SQ3R conditions. Students were given one point for each information unit retold. They were informed at the beginning of each session how many points they had obtained the previous session. Students exchanged points for items such as candy bars, soft drinks, and school t-shirts following every fifth session.

Baseline. After identification of the date and passage title and the presentation of points and word cards, participants were given the following instruction: "Read and study this passage the best way you can. You have 20 minutes. Then, I'll stop you and ask each of you, one at a time, to tell me everything you can. I'll call on you to retell in the order listed on the sheet I've posted. The order for retelling will change every day. While reading, if you come to a word you don't know, ask me." At the end of 20 minutes the passages were collected. The retelling procedure was then initiated.

SQ3R condition. The identification of the date, passage title, and presentation of points and word preview were the same as in baseline. The SQ3R condition was conducted in teacher-directed lessons. In the first session, the teacher said: "We're going to use a special study technique called SQ3R to work on the passages today." The teacher pointed to a chart on the wall delineating the procedures for SQ3R. Then the following were undertaken.

1. Surveying the Passage: The teacher said, "The S means Survey. To survey means to read the title and all of the subheads to get an idea of what the passage is going to be about. Let's do that." Students were called on to read the title and subheads. Assistance was provided if necessary.

2. Question: The teacher said, "Look at the chart; the Q means Question. This means to turn the title and subheads into questions. This helps you know what important details to look for. I'll do the title for you." After exemplifying the process with the title, the students were called on in turn to convert the subheads to questions. Assistance was provided as necessary.

3. Read: The teacher said, "Look at the chart again. The first R means Read. I'm going to give you 10 minutes to read the passage silently. Begin now. If you come to a word you don't know, ask me."

4. Recite: After 10 minutes the teacher said, "Look back at the chart. The next R stands for Recite. This means to say out loud or to yourself the details you found under each subhead. Let's see what you can remember without looking. Turn the passage over." The teacher then read the first subhead and asked a student to recall all the facts he could. After the student finished, the group turned the passage over again and looked for anything important that was forgotten under that subhead. The same process was carried out for each subhead.

5. Review: The teacher said, "Now look at the chart one more time. The last R stands for Review. This means to silently reach each subhead and without looking at what is in that section, silently try to say to yourself the important details. After you read each subhead, cover that section with your hand and see how many things you can remember. Then look back at the section and see if you forgot anything important. Do the same with each subhead until you're done. I'll give you 3 minutes to review, then we'll retell and see how many details you can remember today." The passages were collected after 3 minutes. All but the student whose name was first on the "order of retelling card" moved to the music headphones

and magazines. After verification that students had put on the headphones, the retelling process began.

Subsequent to the third day the procedure changed slightly. Rather than the teacher explaining each step to the students, the students were asked to tell the teacher what was involved in each step. A volunteer was prompted with questions such as, "Who can remind us what 'survey' means?" or "Who can tell us today what 'question' means?".

Results and Discussion

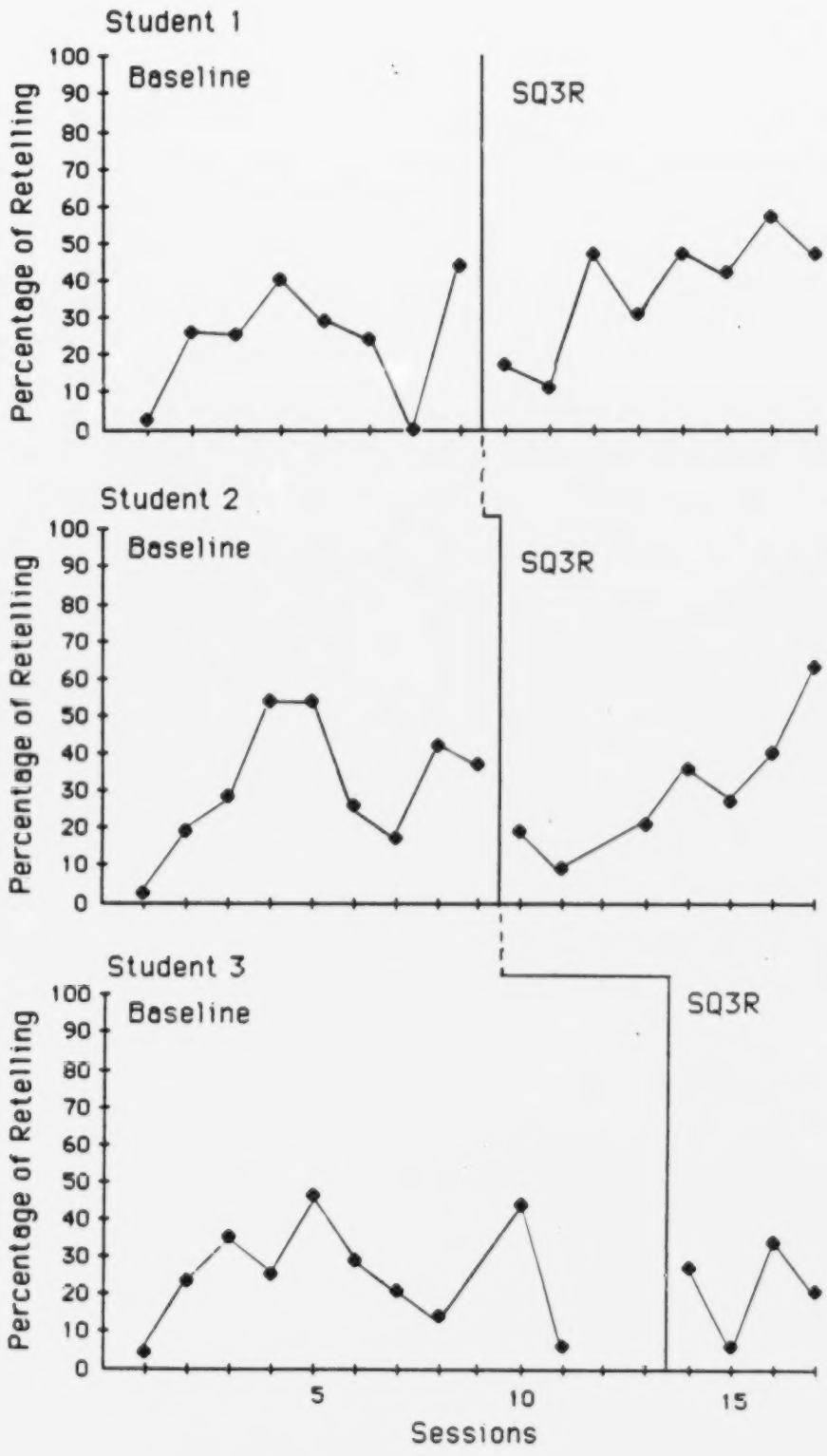
Figures 1, 2, and 3 present data for Experiment 1. In Figure 1, the mean percentage of retelling for student 1 was 24% (0% to 44%) during baseline and 33% (11% to 57%) during SQ3R; 31% (2% to 54%) during baseline and 31% (9% to 63%) during SQ3R for student 2; and a mean of 25% (4% to 46%) for retelling during baseline and 22% (6% to 34%) during SQ3R for student 3.

In Figure 2, the mean percentage of retelling for student 4 was 30% (15% to 46%) during baseline and 36% (13% to 57%) during SQ3R; 24% (4% to 46%) during baseline and 13% (4% to 27%) during SQ3R for student 5; and a mean of 21% (2% to 42%) for retelling during baseline and 31% (9% to 57%) during SQ3R for student 6.

In Figure 3, the mean percentage of retelling for student 7 was 29% (2% to 38%) during baseline and 49% (17% to 72%) during SQ3R; 18% (4% to 29%) during baseline and 20% (4% to 37%) during SQ3R for student 8; and a mean of 19% (4% to 43%) for retelling during baseline and 29% (6% to 48%) during SQ3R for student 9.

These data showed that the SQ3R procedure had no functional effect on retelling skills for 8 of 9 participants. Although for some of these 8 students means were slightly higher for SQ3R, for others they were lower.

FIGURE 1


Student 1
Baseline
SQ3R
Percentage of Retelling
100
90
80
70
60
50
40
30
20
10
0
Student 2
Baseline
SQ3R
Percentage of Retelling
Student 3
Baseline
SQ3R
Percentage of Retelling
5
10
15
Sessions

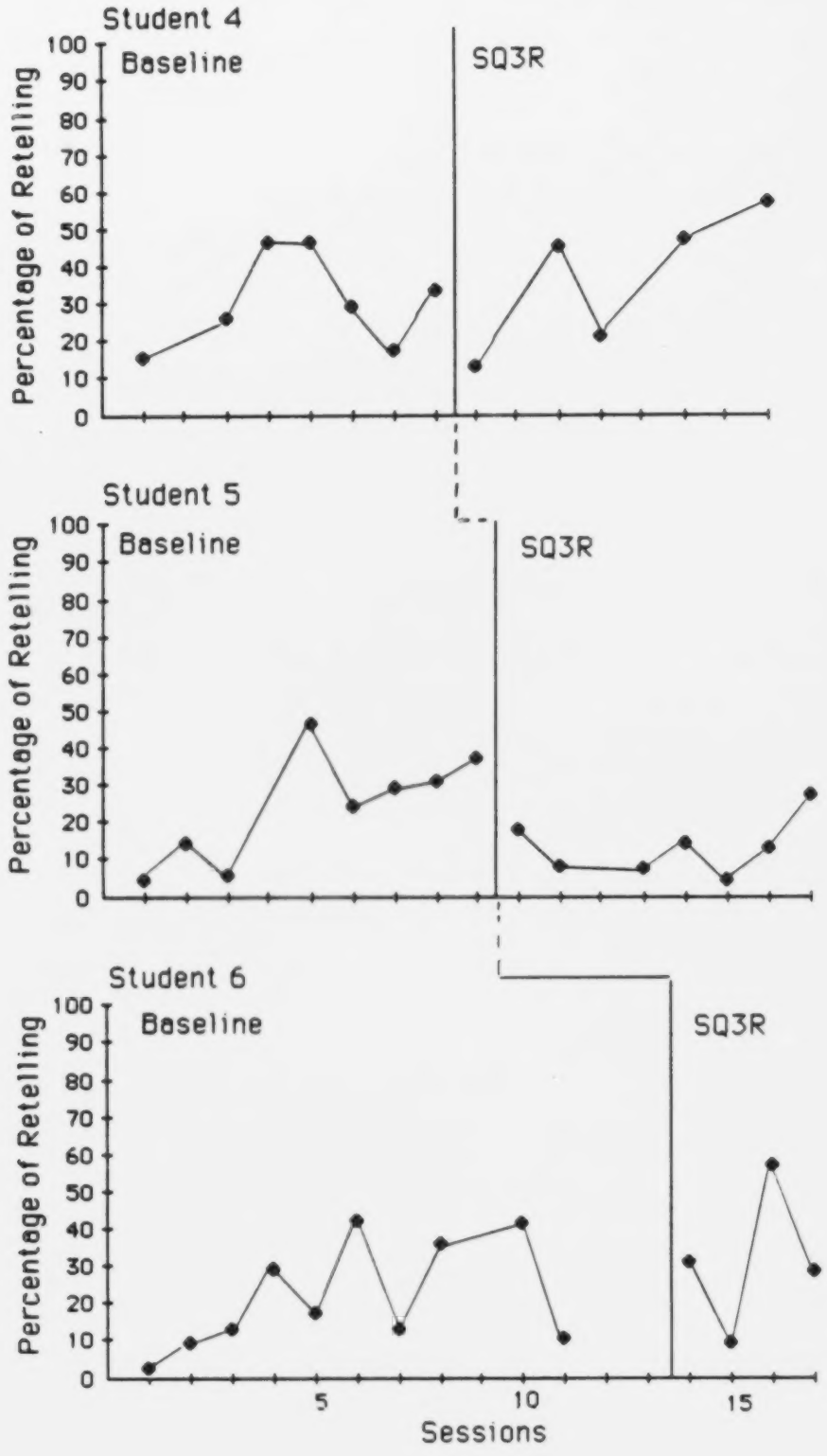
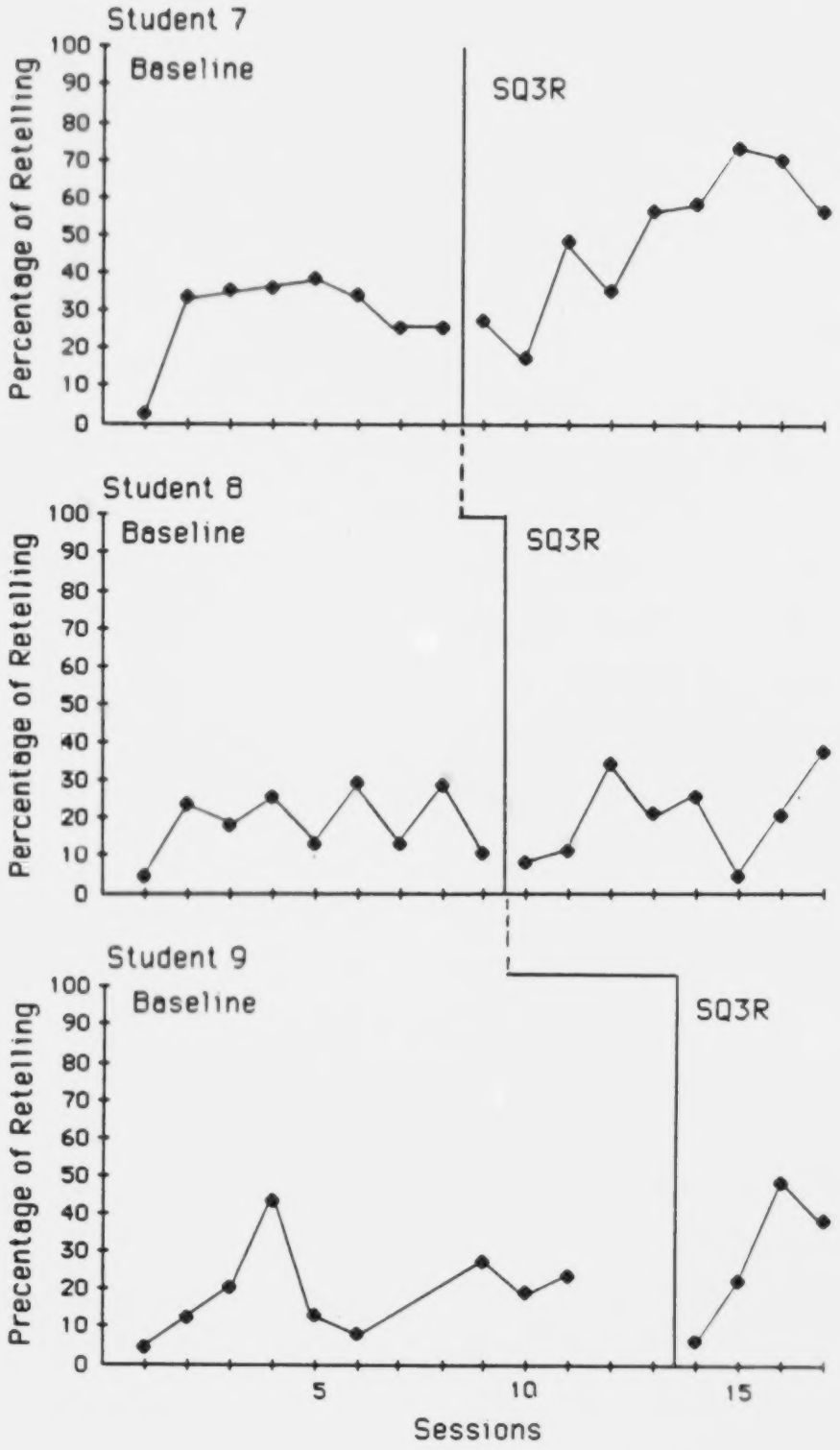

Student 4
Baseline
SQ3R
Percentage of Retelling
100
90
80
70
60
50
40
30
20
10
0
Student 5
Baseline
SQ3R
Percentage of Retelling
Student 6
Baseline
SQ3R
Percentage of Retelling
5
10
15
Sessions

FIGURE 3


Student 7
Baseline
SQ3R
Percentage of Retelling
100
90
80
70
60
50
40
30
20
10
0
Student 8
Baseline
SQ3R
Percentage of Retelling
Student 9
Baseline
SQ3R
Precentage of Retelling
5
10
15
Sessions

In conjunction with this, most of the data points for baseline and SQ3R conditions were overlapping, indicating no clear differentiation between treatments. Only student 7 demonstrated a clear increasing trend in the percentages of retelling following the introduction of SQ3R. These results failed to support the experimental analyses of Douge (1983) and Alexander (1985) in which subjects were elementary level students with learning disabilities. Since the present study was a systematic replication of their studies, failure to replicate these two experiments raised questions concerning the procedural differences incorporated in the current study. Two major differences were noted. The Douge and Alexander experiments used 300-word passages, while the current study employed passages of 1000 words. In addition, the experimenters in those studies prompted all information units during recitations but the current study did not use this procedure. Experiment 2 was developed to investigate the effects of these procedural differences on student retelling.

EXPERIMENT 2

Method

Students and setting. Ten learners who did not participate in Experiment 1 were selected for Experiment 2. As in Experiment 1, participants were Black and Caucasian adjudicated youth who had been designated as learning disabled. Participant selection criteria and setting were the same as reported in Experiment 1. The students ranged in age from 15 to 17 years and read at grade levels between 7.2 and 8.1.

General procedures for all conditions. The general procedures were the same as reported in Experiment 1 with the following exceptions: (a) the Word Preview was eliminated since it is not a normal part of the SQ3R

procedure; (b) the token economy used in Experiment 1 was replaced with self-charting of the number of information units retold; and (c) following the initial baseline period, the three conditions (a continuation of baseline and conditions 1 and 2) were alternated by sessions using a table of random numbers. The data were analyzed using an alternating treatments design (Barlow & Hayes, 1979).

Baseline. The baseline procedure was identical to the SQ3R procedure used in Study 1.

Condition 1. Condition 1 was the same as baseline but with two exceptions: (a) the 1000-word passages were decreased to 300 words; and (b) the time given to participants to read these shorter passages was decreased from 10 minutes to 4 minutes.

Condition 2. Condition 2 was the same as condition 1 except the teacher used a procedure to prompt the occurrence of all information units during the Recite period. To do this, after 4 minutes of reading, the teacher said: "Look back at the chart. The next R stands for Recite. This means to say orally or to yourself the details you found under each subhead. Let's see what you can remember without looking. Turn your passage over." The teacher then called on students in turn to recite all details they could remember and at the same time each information unit recited was tallied by the teacher on an Information Units Sheet. This sheet listed all information units in the passage. Next the teacher told students to turn the passage back over and look at the section under a specified subhead and called on learners in turn to tell anything important that was forgotten. (The teacher tallied these additional items on the Information Units Sheet). Finally the teacher consulted the Information Units Sheet to see if there were any items that had not been recited. If

so, the teacher prompted for omitted information units without telling the answer. For each omitted item, the teacher first said, "Can you remember anything about _____?" If no one could remember, the teacher then said, "Can you find anything about _____?" During the "remember" task, the students covered the passage and tried to think of the items without looking. During the "find" task, they looked in the passage to find the answer. Learners were called on in turn during this prompting condition. In addition to the prompting procedure, condition 2 differed from condition 1 in that the Review procedure was eliminated.

Results and Discussion

Data from Experiment 2 are shown in Figures 4, 5, 6. In Figure 4, the mean percentage of retelling for student 1 was 35% (16% to 48%) during baseline (i.e., 1000-word passages and SQ3R), 63% (39% to 85%) during condition 1 (i.e., 300-word passages and SQ3R), and 73% (25% to 100%) during condition 2 (i.e., 300-word passages, SQ3R, and response prompts); 31% (4% to 53%) during baseline, 60% (36% to 94%) during condition 1, and 83% (62% to 100%) during condition 2 for student 2; 40% (14% to 74%) during baseline, 72% (60% to 95%) during condition 1, and 69% (55% to 95%) during condition 2 for student 3; and, a mean of 33% (15% to 53%) for retelling during baseline, 67% (40% to 88%) during condition 1, and 65% (48% to 88%) during condition 2 for student 4.

In Figure 5, the mean percentage of retelling for student 5 was 17% (8% to 27%) during baseline (i.e., 1000-word passages and SQ3R), 48% (26% to 71%) during condition 1 (i.e., 300-word passages and SQ3R), and 63% (50% to 79%) during condition 2 (i.e., 300-word passages, SQ3R, and response prompts); 30% (16% to 48%) during baseline, 68% (38% to 100%) during condition 1, and 76% (45% to 94%) during condition 2 for student 6; and, a

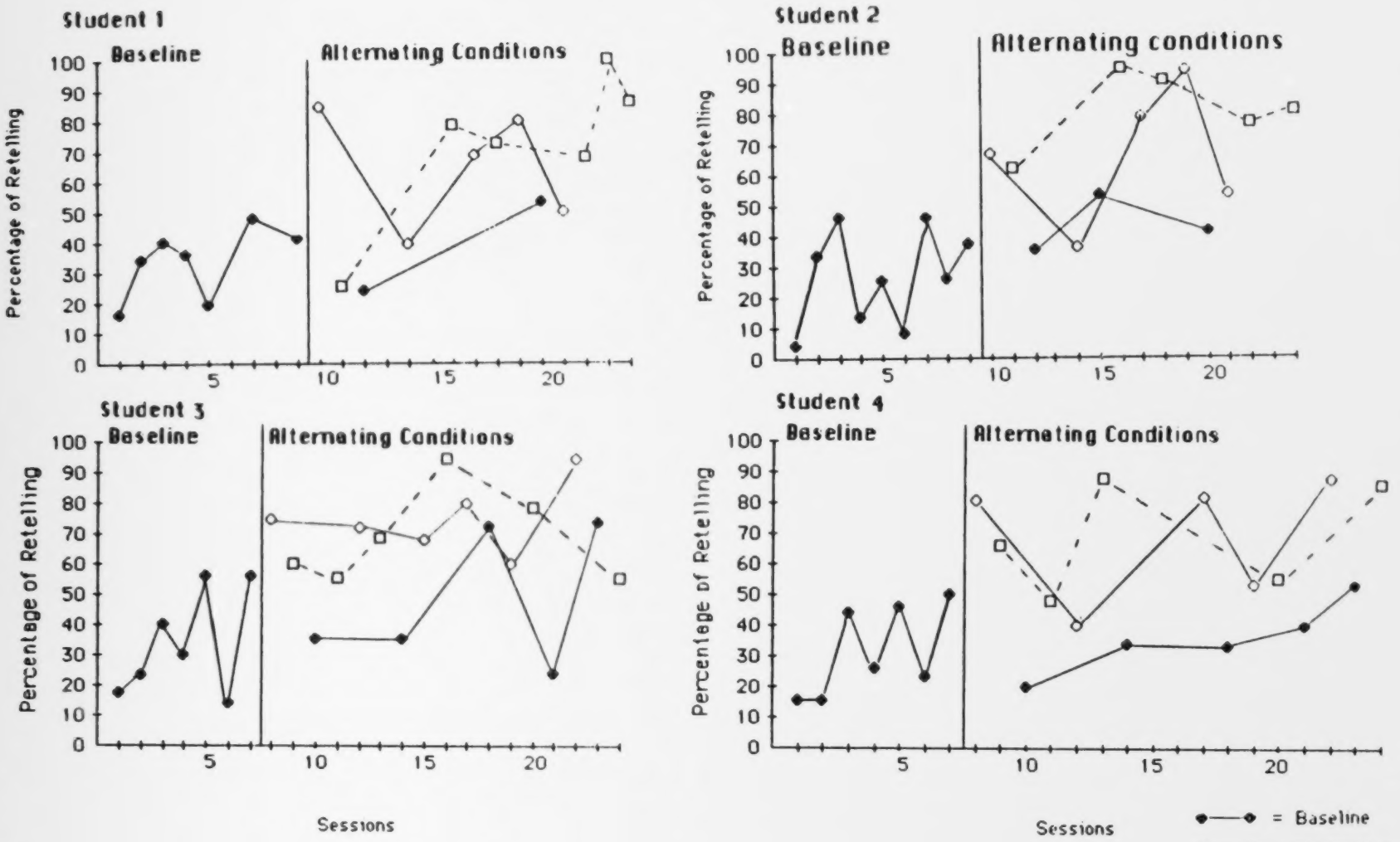

Student 1
Baseline
Alternating Conditions
Student 2
Baseline
Alternating conditions
Student 3
Baseline
Alternating Conditions
Student 4
Baseline
Alternating Conditions
Percentage of Retelling
Sessions
= Baseline
= Condition 1
= Condition 3

FIGURE 1

FIGURE 5

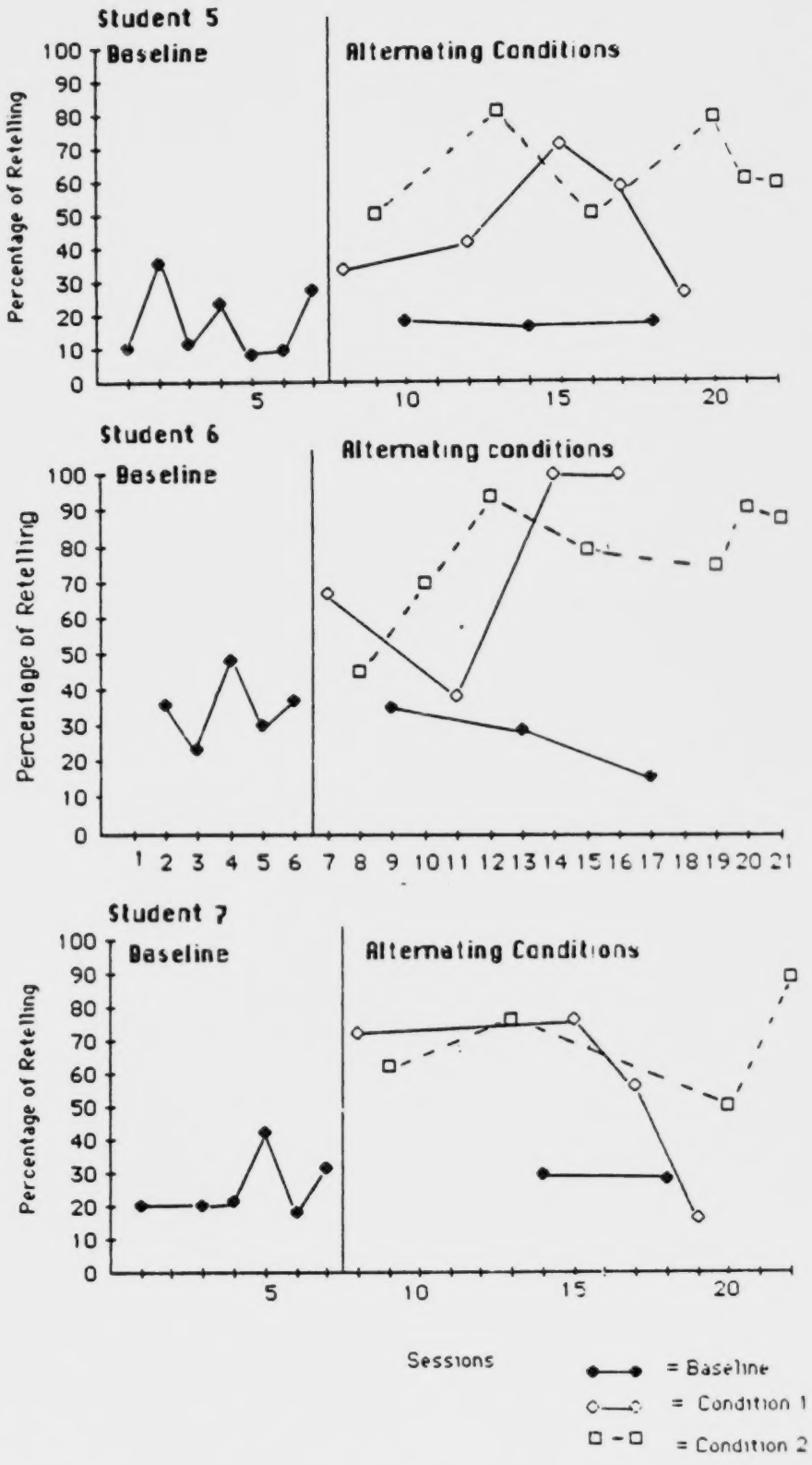
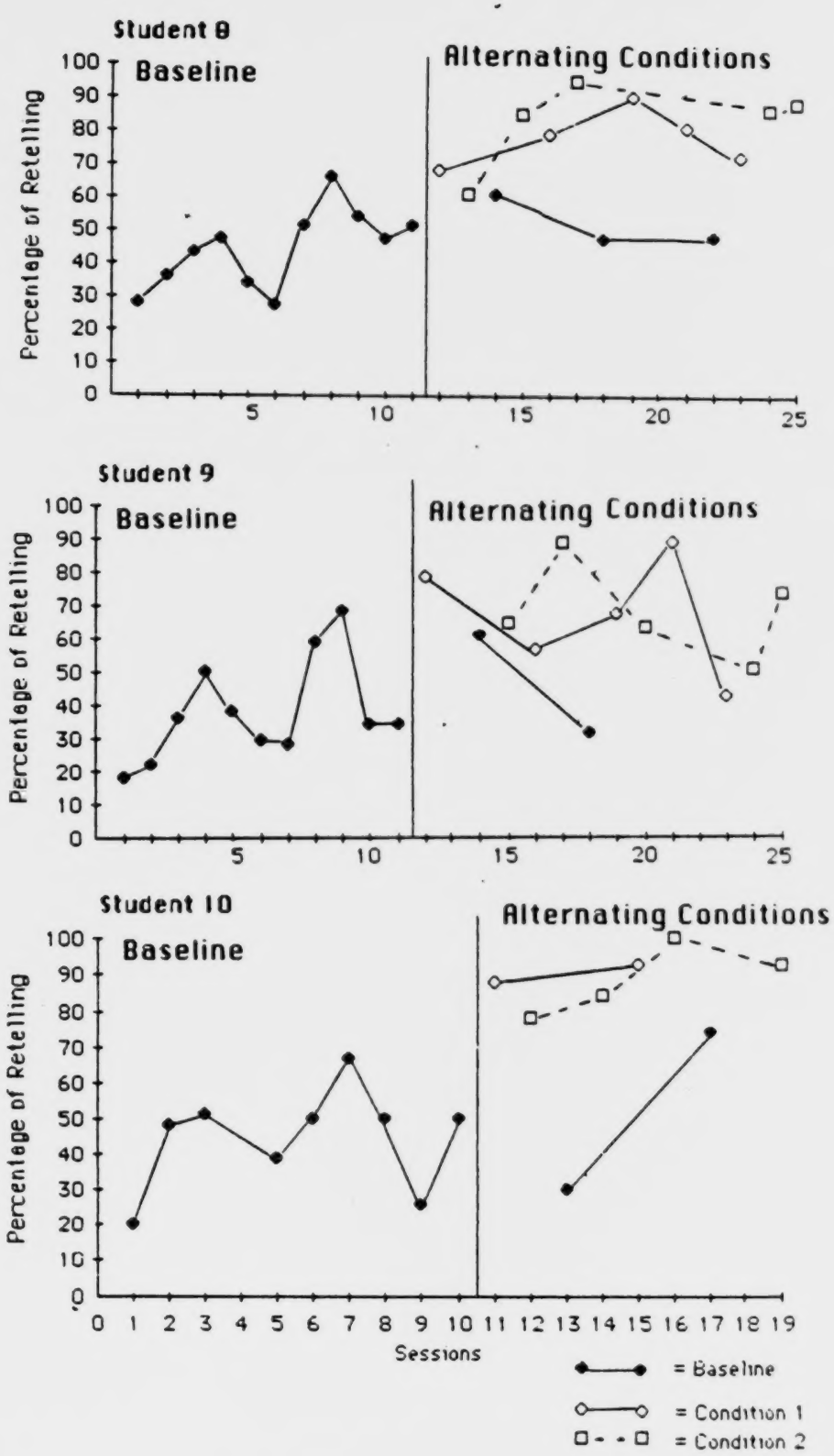

Student 5
Baseline
Alternating Conditions
Percentage of Retelling
Student 6
Baseline
Alternating conditions
Percentage of Retelling
Student 7
Baseline
Alternating Conditions
Percentage of Retelling
Sessions
= Baseline
= Condition 1
= Condition 2

FIGURE 6


Student 8
Baseline
Alternating Conditions
Percentage of Retelling
Student 9
Baseline
Alternating Conditions
Percentage of Retelling
Student 10
Baseline
Alternating Conditions
Percentage of Retelling
Sessions
= Baseline
= Condition 1
= Condition 2

mean of 24% (18% to 31%) for retelling during baseline, 68% (16% to 76%) during condition 1, and 63% (50% to 76%) during condition 2 for student 7.

In Figure 6, the mean percentage of retelling for student 8 was 46% (27% to 66%) during baseline (i.e., 1000-word passages and SQ3R), 79% (68% to 90%) during condition 1 (i.e., 300-word passages and SQ3R), and 80% (61% to 95%) during condition 2 (i.e., 300-word passages and SQ3R, and response prompts); 39% (18% to 68%) during baseline, 67% (56% to 88%) during condition 1, and 72% (63% to 88%) during condition 2 for student 9; and, a mean of 46% (20% to 74%) for retelling during baseline, 91% (88% to 93%) during condition 1, and 87% (78% to 100%) during condition 2 for student 10.

These results demonstrate a functional relationship between the size of the passage read and the percentage of information units retold. Figures 4, 5, and 6 indicate that retellings were fractionated between 1000 - word passages and 300-word. All students retold more information units from 300 word passages than from 1000-word passages. The data also showed that recitation (employing the prompting procedure) and review were not functionally related to student retelling. All students were as likely to retell as well with either recitation or review. Only number of words read was functionally related to increased retelling.

Since all conditions in Experiment 2 employed SQ3R, the question remained to be answered: Will learners retell more information units from 300-word passages when using the SQ3R procedure than when not? Experiment 3 addressed this question.

EXPERIMENT 3

Method

Students and setting. Nine learners who had not participated in the two previous experiments participated in Experiment 3. Participant selection criteria and setting were the same as reported in Experiments 1 and 2. The students ranged in age from 15 to 17 years and read at grade levels between 6.2 and 8.5.

Baseline and SQ3R conditions. Baseline and SQ3R conditions were identical to those reported in Experiment 1 except that (a) 300-word passages were used rather than 1000-word passages; and (b) the token economy used in Experiment 1 was replaced with self-charting of the number of information units retold. This experiment employed a combination reversal and multiple baseline across subjects design (Baer, Wolf, & Risley, 1968).

Results and Discussion

Figures 7, 8, and 9 present data for Experiment 3. In Figure 7, the mean percentage of retelling for student 1 was 21% (12% to 26%) during baseline 1, 36% (17% to 55%) during SQ3R and 58% (35% to 71%) during baseline 2; 45% (25% to 74%) during baseline and 58% (39% to 86%) during SQ3R for student 2; and a mean of 31% (16% to 45%) for retelling during baseline and 29% (15% to 43%) during SQ3R for student 3.

In Figure 8, the mean percentage of retelling for student 4 was 33% (25% to 39%) during baseline 1, 51% (40% to 66%) during SQ3R and 68% (49% to 81%) during baseline 2; 32% (7% to 48%) during baseline and 41% (24% to 52%) during SQ3R for student 5; and a mean of 54% (21% to 64%) for retelling during baseline and 54% (21% to 72%) during SQ3R for student 6.

In Figure 9, the mean percentage of retelling for student 7 was 25%

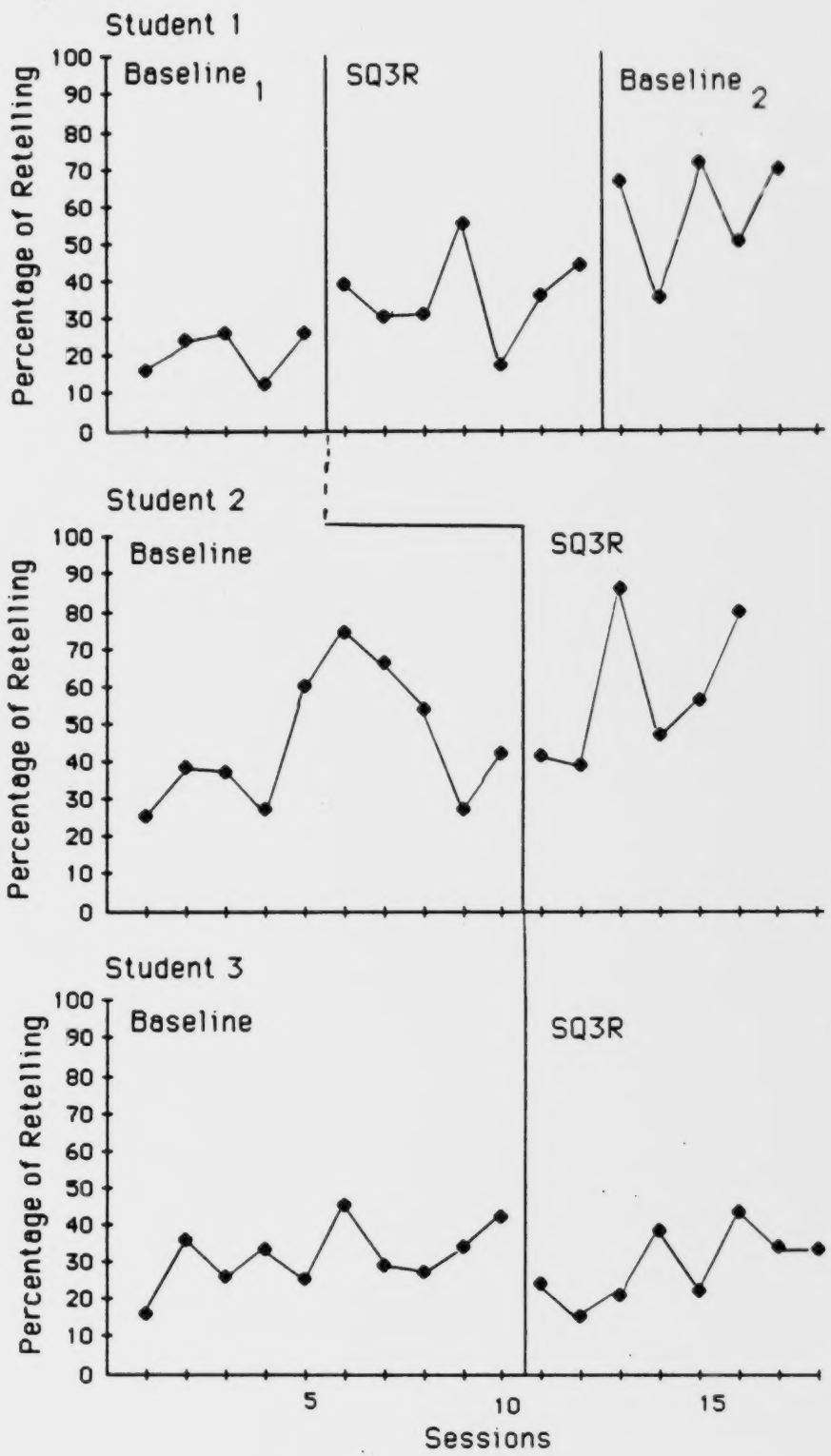

Student 1
Baseline 1
SQ3R
Baseline 2
Percentage of Retelling
Student 2
Baseline
SQ3R
Percentage of Retelling
Student 3
Baseline
SQ3R
Percentage of Retelling
100
90
80
70
60
50
40
30
20
10
0
5
10
15
Sessions

FIGURE 3

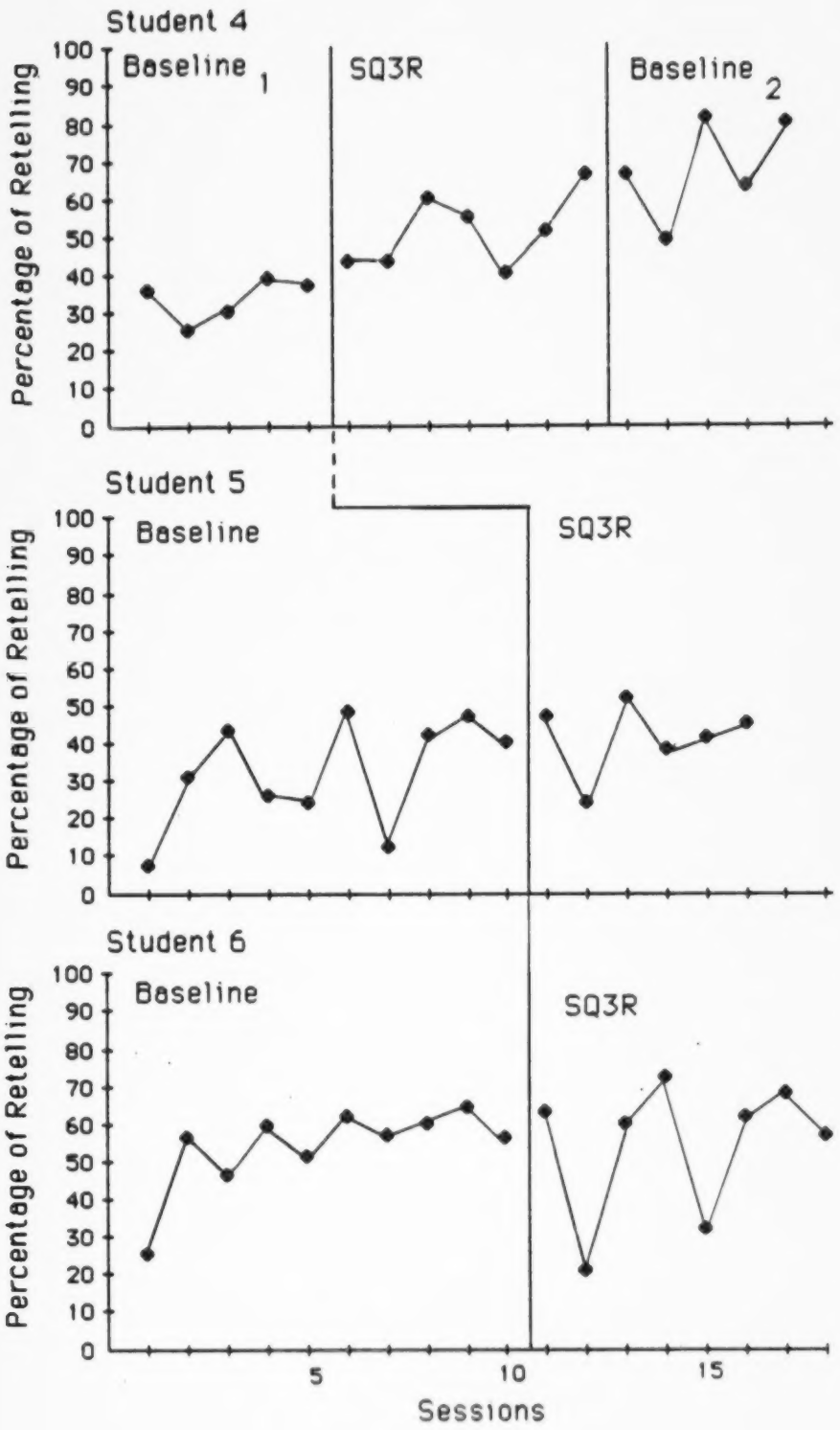
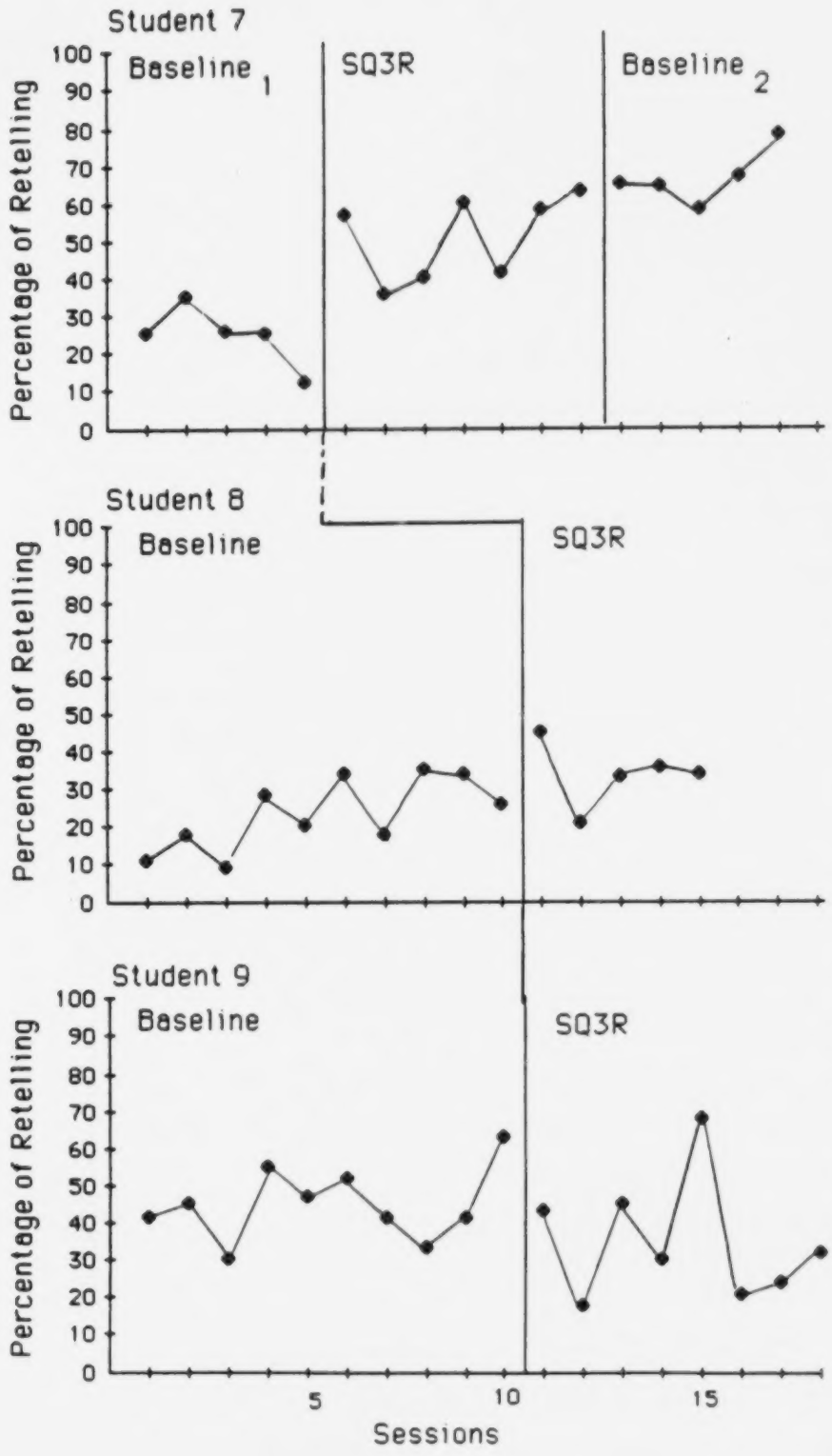

Student 4
Baseline 1
SQ3R
Baseline 2
Percentage of Retelling
Student 5
Baseline
SQ3R
Percentage of Retelling
Student 6
Baseline
SQ3R
Percentage of Retelling
0
10
20
30
40
50
60
70
80
90
100
5
10
15
Sessions

FIGURE 9


Student 7
Baseline 1
SQ3R
Baseline 2
Percentage of Retelling
Student 8
Baseline
SQ3R
Percentage of Retelling
Student 9
Baseline
SQ3R
Percentage of Retelling
100
90
80
70
60
50
40
30
20
10
0
5
10
15
Sessions

(2% to 38%) during baseline 1, 51% (36% to 63%) during SQ3R and 66% (58% to 78%) during baseline 2; 23% (9% to 35%) during baseline and 34% (21% to 45%) during SQ3R for student 8; and a mean of 45% (30% to 63%) for retelling during baseline and 35% (18% to 68%) during SQ3R for student 9.

Students 1, 4, and 7 increased their percentages of retelling after the SQ3R procedure was introduced, not a robust finding since they represented only one-third of the subjects in the study. Furthermore, experimental control was not demonstrated and no functional relationships shown because percentages of retelling continued to increase during Baseline 2. As with Experiment 1, data for the other students were mixed, with slightly higher mean scores during SQ3R in certain cases, lower scores in some cases, and showing equal effects in others. In addition, for these students most data points in the SQ3R condition overlapped with lower baseline scores.

EXPERIMENT 4

Method

Students and setting. Six learners, Black and Caucasian, who had not participated in the previous experiments participated in Experiment 4. Participant selection criteria and setting were the same as reported in Experiments 1 through 3. The students ranged in age from 14 to 17 years and read at grade levels between 7.7 and 8.6.

Baseline and SQ3R conditions. Baseline and SQ3R conditions were identical to Experiment 3 except the SQ3R process was modified in two ways. Replacing the Survey phase in SQ3R, S represented a "setting the stage" phase where the students were given background information about the material before it was read. To do this, each teacher read a scripted

statement about the passage to the students. These statements, referred to as "schemata statements", were approximately 100 words in length (range = 90 - 110 words) and required approximately one minute to read aloud. The purposes of the schemata statements were to relate new information to be read in the passage to students' prior knowledge, to add information to information in students' existing schemata, and to generage interest in the selection they would subsequently read. The following criteria were used in preparing the schemata statements:

1. Information provided in each passage was not duplicated in the schemata statement designed to be used prior to reading that passage.
2. A "story map" model (Beck, Omanson, & McKeown, 1982) was employed so that each schemata statement had elements referring to (a) the persons involved, (b) the setting (time and place), and (c) the the problem. Each schemata statement ended by indicating that the resolution would be specified in the passage, asking an inferential question, or directing students to read for specific information.

In addition, a prediction phase replaced the question phase, resulting in SP3R, where the students were required to make a prediction about each subhead in response to scripted prediction questions asked by the teacher. The purposes of the prediction phase were to stimulate awareness of the central ideas in the text to be read, to allow students who did not possess background information about the topic to benefit from the discussions of others, and to activate interest. The prediction questions for each passage were prepared prior to the initiation of Study 4 and were written so there was one question related to information following each subhead in

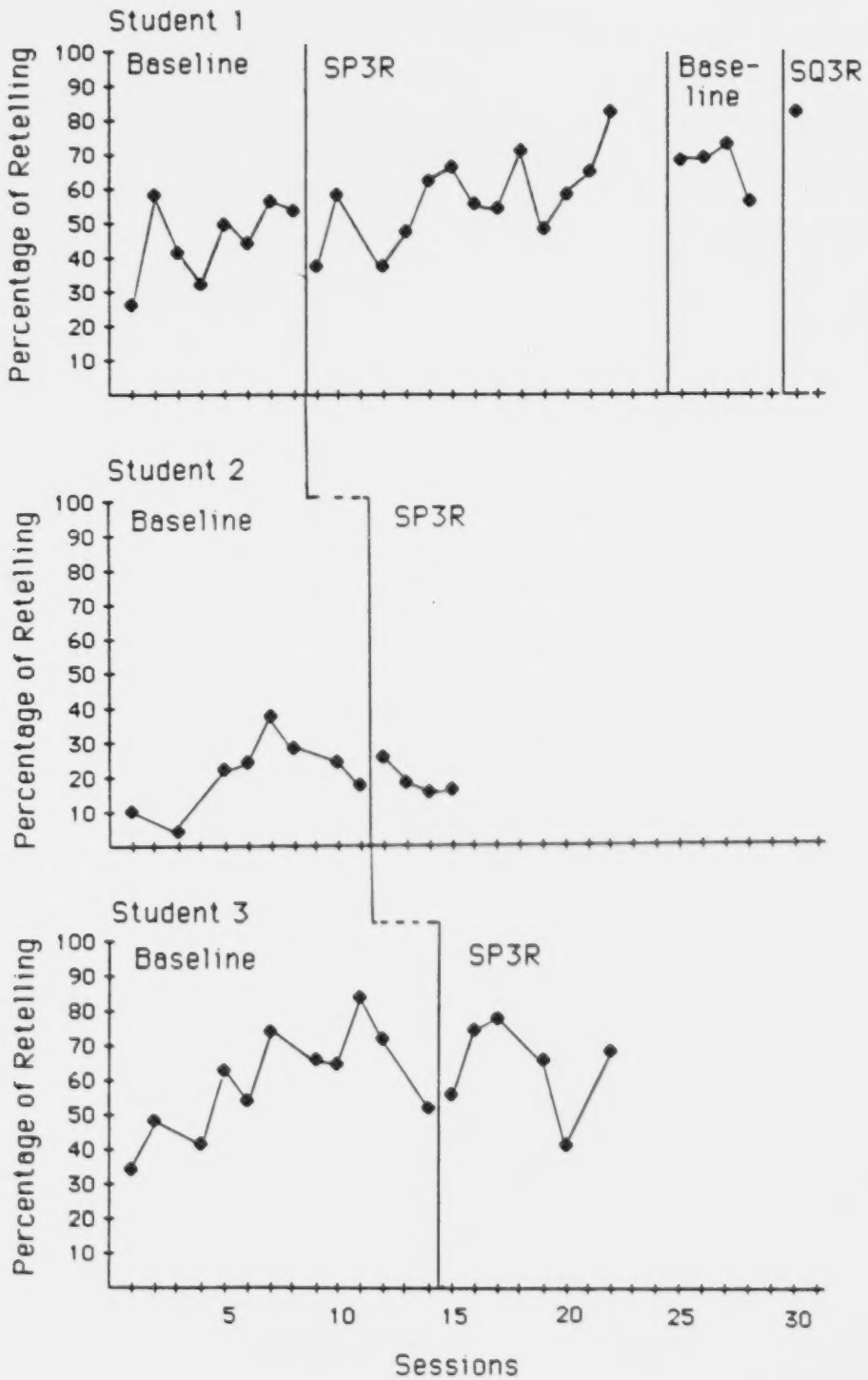
the passage. These were typed and read aloud to the students by the teachers. Students were required to make predictions and defend their reasoning before reading the selection chosen for that session.

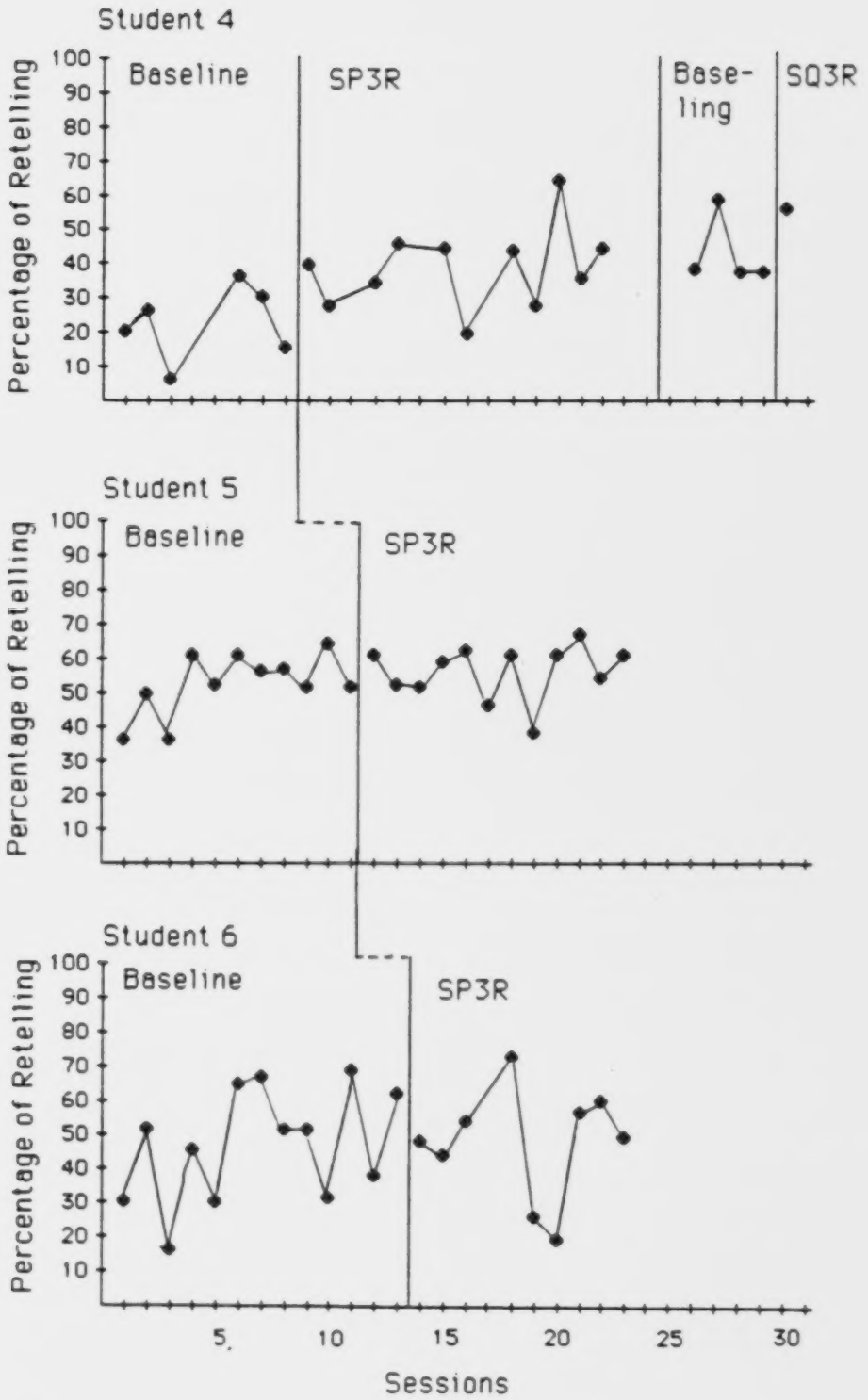
In summary, the major changes in Study 4 were (a) replacing the traditional "Survey" phase with a "Setting the Stage" phase involving use of schemata statements, and (b) replacing the traditional "Question" phase with a "Prediction" phase in which students answered prediction questions posed by the teacher. In addition, the Word Preview procedure was eliminated in both the baseline and intervention (SP3R) conditions. The Read, Recite, and Review procedures were the same as in Study 3. Data for Study 4 were analyzed within the context of an ABAB reversal design (Hersen & Barlow, 1976).

Results and Discussion

Figures 10 and 11 present data for Experiment 4. As can be seen in Figure 10, the mean percentage of retelling for student 1 was 45% (26% to 58%) during baseline, 57% (37% to 82%) during SP3R, 67% (56% to 73%) during a return to baseline, and 82% for one session during a return to SP3R; 21% (4% to 37%) during baseline and 19% (15% to 25%) during SP3R for student 2; and a mean of 60% (34% to 84%) for retelling during baseline and 62% (41% to 78%) during SP3R for student 3.

As shown in Figure 11, the mean percentage of retelling for student 4 was 22% (6% to 36%) during baseline, 38% (19% to 64%) during SP3R, 43% (37% to 59%) during a return to baseline, and 56% for one session during a return to SP3R; 52% (36% to 61%) during baseline and 56% (51% to 67%) during SP3R for student 5; and a mean of 47% (16% to 69%) for retelling during baseline and 48% (19% to 73%) during SP3R for student 6.


Student 1
Baseline
SP3R
Base-
line
SQ3R
Percentage of Retelling
100
90
80
70
60
50
40
30
20
10
Student 2
Baseline
SP3R
Percentage of Retelling
Student 3
Baseline
SP3R
Percentage of Retelling
5
10
15
20
25
30
Sessions


Student 4
Baseline
SP3R
Base-
ling
SQ3R
Percentage of Retelling
100
90
80
70
60
50
40
30
20
10
Student 5
Baseline
SP3R
Percentage of Retelling
Student 6
Baseline
SP3R
Percentage of Retelling
5
10
15
20
25
30
Sessions

These data showed that the adapted SQ3R procedure (SP3R) had no functional effect on retelling performance of any of the 6 participants. The means were slightly higher for SP3R for 5 of the 6 students but these differences were not great enough to be of educational significance. In conjunction with this, most of the data points for baseline and SP3R were overlapping, indicating no clear differentiation between treatments.

EXPERIMENT 5

Method

Students and setting. Six learners who had not participated in the four previous experiments participated in Experiment 5. Participant selection criteria and setting were the same as reported in Experiments 1 through 4. The students, Black and Caucasian, ranged in age from 15 to 17 years and read at grade levels between 5.4 and 6.3.

Baseline and SQ3R conditions. Baseline and SQ3R conditions were identical to those reported in Study 3 except that the seventh-grade level passages were used with students who were reading at approximately fifth-grade level. In Studies 1, 2, 3, and 4, materials were used that were approximately at the students' reading levels. Since no substantive effects were found after use of SQ3R (or the adapted procedure SP3R), Experiment 5 asked the question of whether SQ3R would be efficacious if the material was difficult for the students. That is, Study 5 sought to determine if SQ3R would produce positive effects if the material was above the students' reading instructional levels (a situation occurring frequently for students with learning disabilities when they are instructed in regular classroom settings.) It was hypothesized that the fairly intensive SQ3R procedures might be unnecessary when students read at

their instructional levels, but that the additional procedures might facilitate comprehension to a greater degree than typical read-reread study techniques when selections were more complex in terms of vocabulary, sentence structure, and concepts. Data for Study 5 were examined within the context of an ABAB reversal design (Hersen & Barlow, 1976).

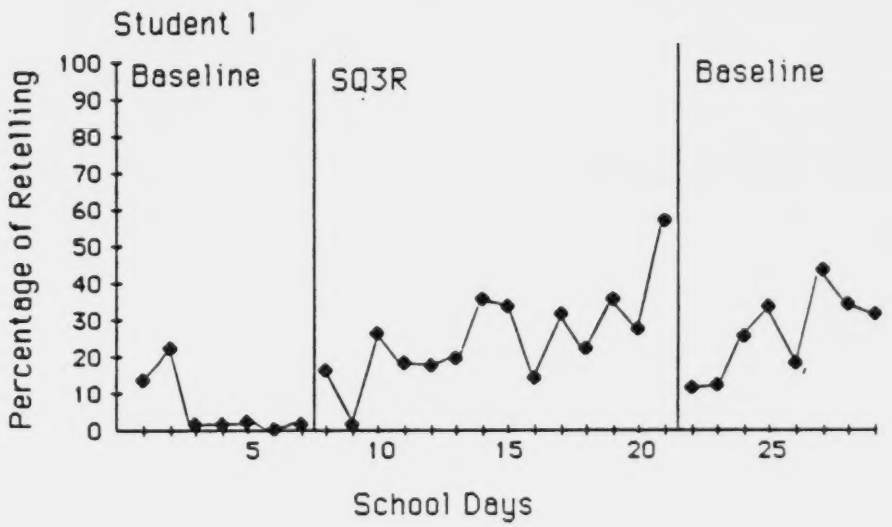
Results and Discussion

Figures 12 and 13 present data for Experiment 5. In Figure 12, the mean percentage of retelling for student 1 was 6% (0% to 22%) during baseline, 24% (1% to 57%) during SQ3R, and 26% (11% to 43%) during a return to baseline; 27% (12% to 42%) during baseline, 48% (36% to 73%) during SQ3R and 48% (23% to 59%) during a return to baseline for student 2.

In Figure 13, the mean percentage of retelling for student 3 was 8% (2% to 12%) during baseline, 14% (2% to 40%) during SQ3R, and 17% (7% to 27%) during a return to baseline; 2% (0% to 3%) during baseline, 26% (10% to 54%) during SQ3R and 29% (0% to 49%) during a return to baseline for student 4; and 11% (5% to 21%) during baseline, 18% (5% to 35%) during SQ3R and 23% (13% to 32%) during a return to baseline for student 5.

All five students increased their mean percentages of retelling after the SQ3R procedure was introduced; some increased by a substantial amount. However, experimental control was not demonstrated and no functional relationships between retelling and application of SQ3R was shown because all students' percentages of retelling continued to increase during a return to baseline with the exception of student 2 where the mean percentage of retelling was the same for SQ3R and the return to baseline. During the return to baseline condition, the experimenters observed the students independently using the SQ3R procedure they had experienced in the

FIGURE 12


Student 1
Baseline
SQ3R
Baseline
Percentage of Retelling
100
90
80
70
60
50
40
30
20
10
0
5
10
15
20
25
School Days

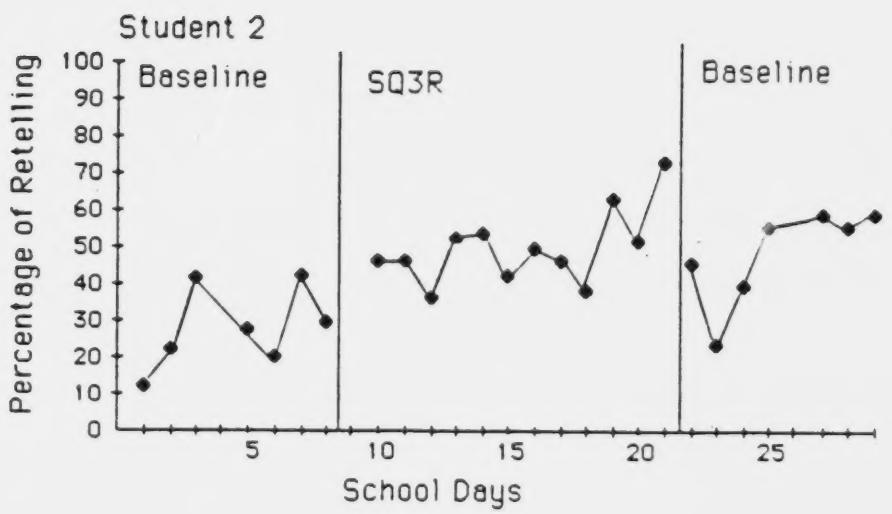
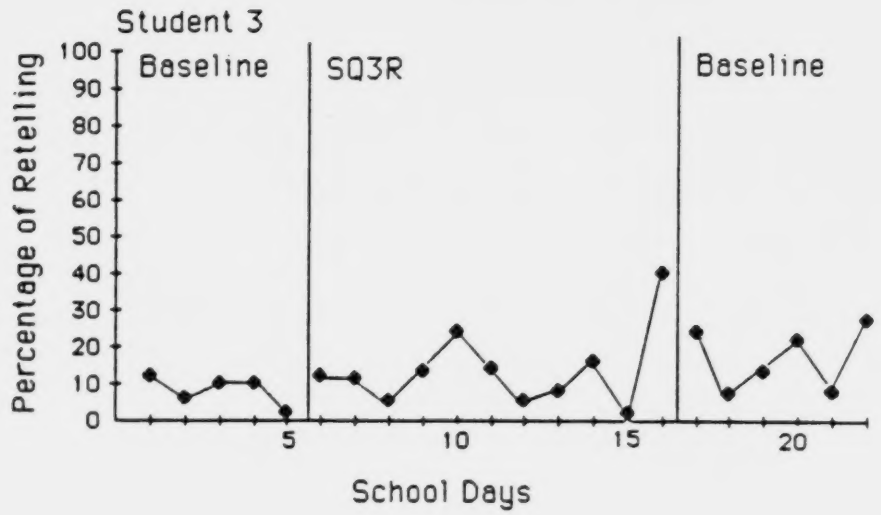
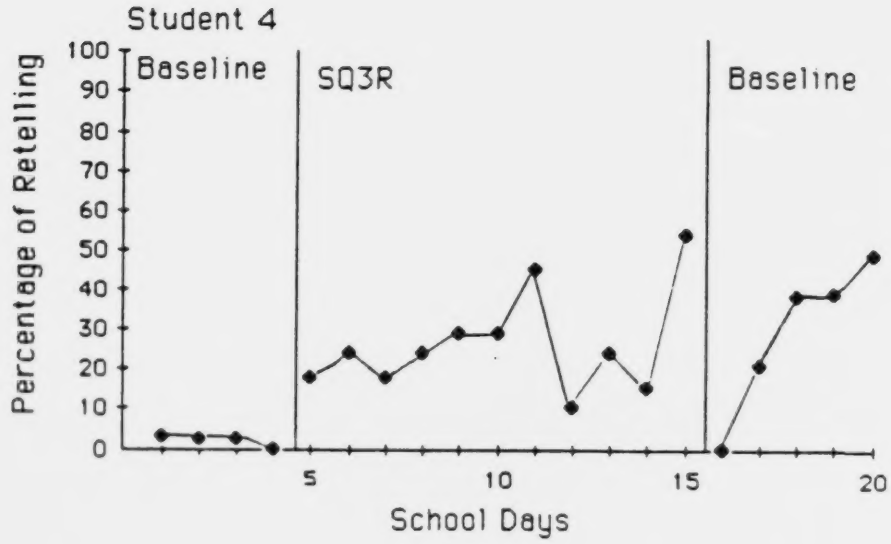
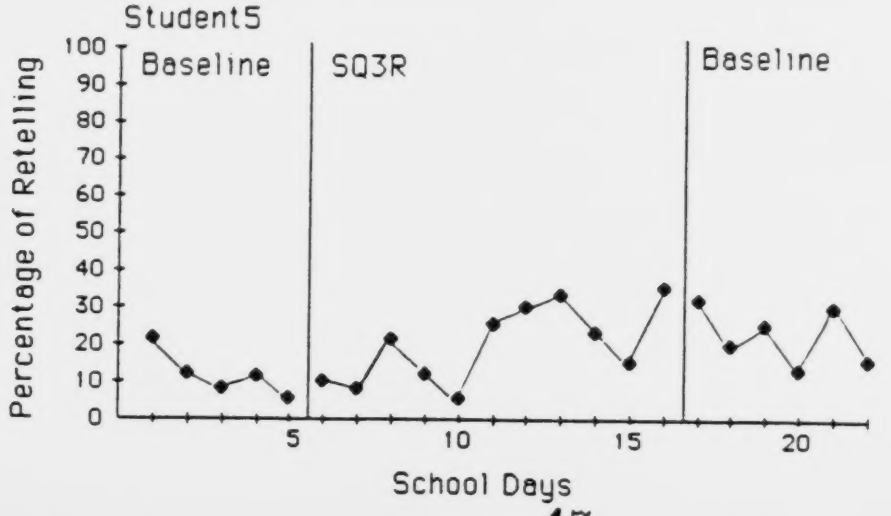

Student 2
Baseline
SQ3R
Baseline
Percentage of Retelling
100
90
80
70
60
50
40
30
20
10
0
5
10
15
20
25
School Days

FIGURE 12


Student 3
Baseline
SQ3R
Baseline
Percentage of Retelling
100
90
80
70
60
50
40
30
20
10
0
5
10
15
20
School Days


Student 4
Baseline
SQ3R
Baseline
Percentage of Retelling
100
90
80
70
60
50
40
30
20
10
0
5
10
15
20
School Days


Student5
Baseline
SQ3R
Baseline
Percentage of Retelling
100
90
80
70
60
50
40
30
20
10
0
5
10
15
20
School Days

previous condition even though they were not directed to do so. Although this seemed to bode well for transfer of use of the SQ3R procedure, the strength of the treatment could not be verified since no reversal in retelling was seen. Therefore, Experiment 6 was planned to examine the same question in the context of an experimental design which can avoid the problem of transfer of effect during analysis.

EXPERIMENT 6

Method

Students and setting. Six learners who had not participated in the five previous experiments participated in Experiment 6. Participant selection criteria and setting were the same as reported in Experiments 1 through 5. The students ranged in age from 15 to 16 years and read at grade levels between 5.0 and 7.6. There were two groups. One group was composed of two students whose reading level approximately matched the reading level of the material, and one student whose reading level was approximately two grade levels below the reading level of the material. The other group was composed of two students whose reading was approximately two grade levels below the level of the material and one student whose reading level matched the reading level of the material.

Baseline and SQ3R conditions. A multiple baseline design was used in Experiment 6 (Baer, Wolf, & Risley, 1968). The baseline procedure was identical to that used in Experiment 5.

The SQ3R condition included only one variation from those employed in Experiment 5. Since a multiple baseline procedure was used, each student was moved individually into the SQ3R condition upon establishment of a stable trend in the baseline condition. This resulted in the size of the

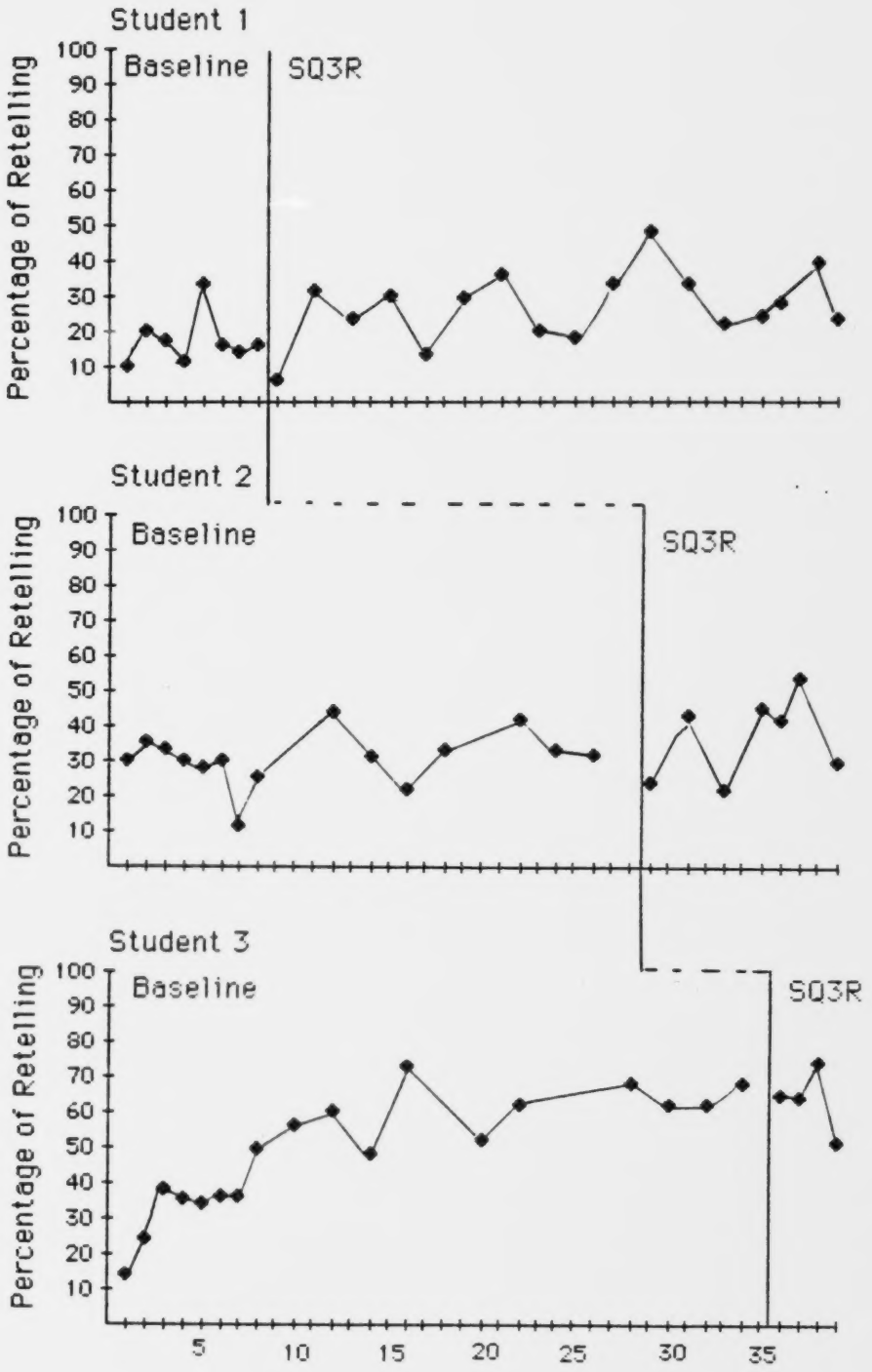
groups varying from one, two, or three students in the SQ3R condition at any one time. Therefore, the procedures were slightly altered to require the number of students present for a session of the SQ3R condition to complete all procedures necessary to implementation of that condition. For example, when there was only one student in attendance, that student was required to pronounce all words in the Word Preview, answer all questions regarding procedures (such as, "What does Survey mean?), and so on.

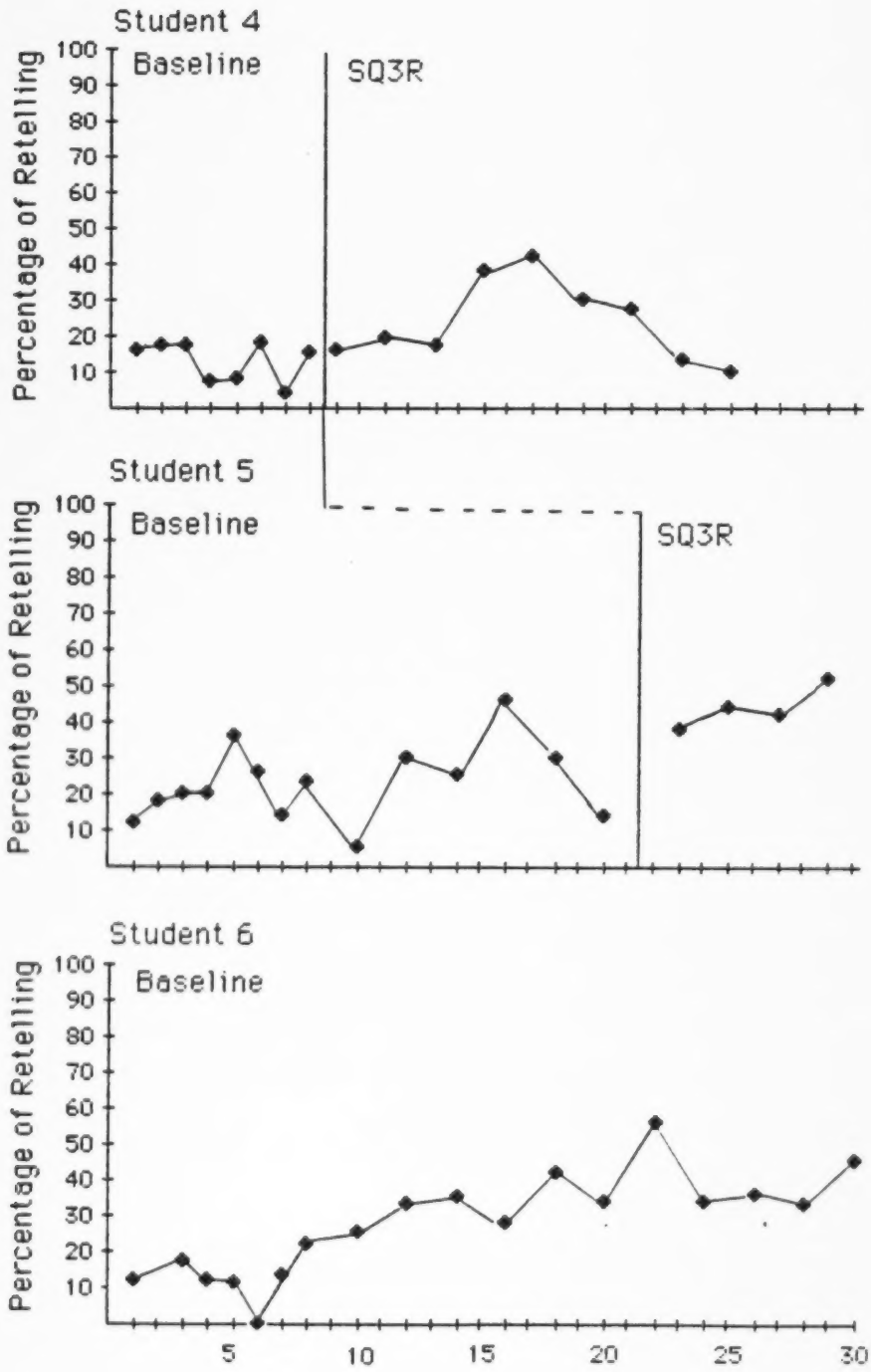
Results and Discussion

Figures 14 and 15 present data for Experiment 6. In Figure 14, the mean percentage of retelling for student 1 was 17% (10% to 33%) during baseline and 27% (6% to 48%) during SQ3R; 31% (11% to 44%) during baseline and 37% (22% to 54%) during SQ3R for student 2; and a mean of 49% (14% to 73%) for retelling during baseline and 63% (51% to 74%) during SQ3R for student 3.

In Figure 15, the mean percentage of retelling for student 4 was 13% (4% to 18%) during baseline and 24% (10% to 42%) during SQ3R; 23% (5% to 46%) during baseline and 44% (38% to 52%) during SQ3R for student 5; and a mean of 27% (0% to 56%) for retelling during baseline for student 6.

Data from Experiment 5 suggested a possible relationship between the difficulty of material read and the use of SQ3R to increase percentage of retelling. Experiment 6 was designed to investigate this possible relationship. In this experiment, the reading achievement of students 1, 2, and 4 was at the fifth grade level and for students 3, 5, and 6 at the seventh grade level. Passages of 300 words at the seventh grade reading level were read by all students. All students reading at seventh grade level retold substantially more information units than students reading


Student 1
Baseline
SQ3R
Percentage of Retelling
100
90
80
70
60
50
40
30
20
10
Student 2
Baseline
SQ3R
Percentage of Retelling
Student 3
Baseline
SQ3R
Percentage of Retelling
5
10
15
20
25
30
35


Student 4
Baseline
SQ3R
Percentage of Retelling
100
90
80
70
60
50
40
30
20
10
Student 5
Baseline
SQ3R
Percentage of Retelling
Student 6
Baseline
Percentage of Retelling
5
10
15
20
25
30

from passage that were 2 years above their reading level.

Slight changes in retelling were demonstrated from baseline to intervention for students 1 and 5. The baseline for student 1 shows a data point that is much higher than the other 7 baseline scores. If that one unusual data point is excluded, then 13 of the 17 SQ3R scores are higher than the baseline retellings. Student 1, even without excluding the unusual data point, increased his retellings by 10% during SQ3R. Likewise, student 5 showed a differential performance during SQ3R. If the highest baseline datum point (i.e., 46%) of student 5 is ignored, a much different visual picture will be seen in Figure 15. All of the SQ3R data points will then be higher than the other 13 baseline scores. Even with that one baseline score overlapping the SQ3R performance, student 5 increased the mean percentage of retellings by 21% during SQ3R. The retellings of students 1 and 5 were better with SQ3R than during baseline. These data showed no relationship between the level of passage difficulty and the effectiveness of SQ3R, however. Student 1 read at the fifth grade level but student 5 read at the seventh grade level.

Student 2 showed no retelling differences during baseline and SQ3R. The large increase of the SQ3R mean score for student 3 seemed to suggest a differential retelling performance between baseline and SQ3R, however, it is misleading to only consider the baseline mean. The baseline performance of student 3 was in a transition state which produced a major increasing trend in performance prior to reaching a steady state. The mean percentage of retelling for student 3 for the last 4 days of baseline (i.e., 65%) was basically the same as the SQ3R mean (i.e., 63%). Similarly, the increase of the SQ3R mean score for student 4 seemed also to suggest a differential retelling performance. The baseline for student 4 was stable, however, the

SQ3R data were in a transitory state. Student 4 showed an increasing trend at the start of SQ3R, then a gradual return to the baseline performance. Student 6 was not introduced to the SQ3R intervention but maintained under baseline conditions. His performance produced a steady increasing trend in percentages of retelling over 30 sessions.

SUMMARY OF FINDINGS AND CONCLUSIONS

SQ3R was originally designed to be an independent study system, however, we believed that for students with learning disabilities it was important to investigate the efficacy of SQ3R in teacher-directed lessons as a first step before studying its effectiveness when students read and studied alone. We based this reasoning on the commonly held conviction that students with learning disabilities need a greater support system than their reading-proficient peers before being introduced to individual studying. If SQ3R proved to be facilitative with teacher assistance, then we intended to study it under independent conditions. If it did not, we assumed SQ3R was even more unlikely to have utility when students were studying alone. At the present stage of investigation little support for use of SQ3R can be offered for the population addressed in this study. Even with direct teacher instruction throughout the lessons, in none of the experiments was SQ3R much more helpful than unstructured study in which students were simply told to "Read and study this passage the best way you know how".

These findings are in contrast with the two studies conducted with elementary grade children with learning disabilities (Douge, 1983; Alexander, 1985). Perhaps the difference lies in a factor suggested by Harris and Sipay (1980), that is, expository material used at higher grade

levels contains more complex text characteristics. There is a large body of research substantiating the effects of text coherence on comprehensibility (e.g., Armbruster, 1984; Frederickson, 1981; Haviland & Clark, 1974; Kintsch, Mandel & Kozminsky, 1977). Furthermore, Kimmel and MacGinitie (1984) have shown that upper grade expository materials frequently are comprised of structures difficult for students who use certain text processing strategies. Poor readers often are unaware of the cohesive relationships which must be attended to for comprehension of difficult expository selections (Bridge & Winograd, 1982). Presumably, in the present study SQ3R was not powerful enough to counter the deleterious effects of these text qualities.

The effects of text coherence on comprehension also may point to reasons why the one positive factor in our experiments (i.e., use of shorter passages) was benefical. When students were assessed after 300-word passages, in which there was less text with which to contend than in the 1,000-word selections, their comprehension scores were higher. Concepts in expository material often run across many sentences and may be tied together by various complex textual signals. Opportunity to stop after a relatively short reading session to report the ideas gained may present an easier task for students with learning disabilities than remembering complicated relationships running across lengthier pieces of prose.

There are two implications of this latter finding. One suggests that secondary teachers of students with learning disabilities intersperse discussions frequently within the reading of longer expository material, which in turn, implies direct teacher instruction for these students rather than independent reading of content area books. This technique is a common

one used by primary grade teachers when children are in the beginning stages of reading acquisition. It may be that this intensive instructional procedure should be re-initiated for students with learning disabilities when they are first learning to contend with the demands of expository text --text having characteristics different from the narrative material with which poor readers have had more instruction (Berkowitz & Taylor, 1981).

A second implication is that publishers develop content area texts specifically for students who have reading difficulties in which discussion questions are integrated at short intervals throughout text selections rather than using the more typical organization of placing questions only after longer portions of text, such as at ends of chapters. This might result in greater recall of previously read portions as well as prompt understanding of subsequent material since, as Ausubel (1960) states, one purpose of this type of text organizer is to "provide ideational scaffolding for the stable incorporation and retention of the more detailed and differentiated material that follows" (p. 148).

In any case, based on the present research, while shorter rather than longer passages can be recommended for secondary students with learning disabilities, it appears that SQ3R should not receive the unequivocal endorsement as a powerful comprehension/study skill that it has received in the past.

LIMITATIONS

1. Single case research methodology was employed in the six experiments of the present study. In some cases, results of single subject research are applicable only to those subjects in the experiment. However, in this methodology, generalizability is established through replication.

In the replications conducted in the present study, results were generally consistent across all experiments.

2. In any instructional situation, (a) context, (b) materials, (c) subjects, and (d) tasks may all effect the outcome. If any of these variables are changed, the results may change. While results were relatively stable across our experiments, in instructional situations with learning disabled students having different characteristics, or if using expository material from a different content area or grade level, or when conducting lessons within a different setting, or if measuring other aspects of comprehension, for example, it is possible that other results may be obtained.

DISSEMINATION EFFORTS

The dissemination of information regarding these research efforts and results include: (a) preparation of an article based on experiments 1, 2, and 3 for the journal, Learning Disabilities Research (completed; to be submitted); (b) preparation of an article based on experiments 4, 5, and 6 which will also summarize the results from experiments 1, 2, and 3 (in progress; to be submitted to an appropriate journal); (c) preparation of a proposal to report the results of all six experiments at the national Applied Behavioral Analysis conference (to be prepared); (d) submission of this Final Report to the ERIC database system.

In addition, throughout the 3 years of this project, the co-investigators have received inquiries about the results of this research from administrators of special education programs in various locations across the country. Interim reports have been sent and this Final Report will be sent to these interested individuals.

REFERENCES

Adams, A., Carnine D., & Gernsten, R. (1982). Instructional strategies for studying content area texts in the intermediate grades. Reading Research Quarterly, 18, 27-55.

Alexander, D. F. (1985). The effect of study skill training on learning disabled students' retelling of expository material. Journal of Applied Behavior Analysis, 18, 263-267.

Alley, G., & Deshler, D. (1979). Teaching the learning disabled adolescent: Strategies and methods. Denver: Love.

Armbruster, B. B. (1984). The problem of "inconsiderate text." In G. G. Duffy, L. R. Roehler, & J. Mason (Eds.), Comprehension instruction: Perspectives and suggestions (pp. 202-217). New York: Longman.

Ausubel, D. P. (1960). The use of advance organizers in learning and retention of meaningful material. Journal of Educational Psychology, 51, 267-272.

Baer, D. M., Wolf, M. M., & Risley, T. (1968). Current dimensions of applied behavior analysis. Journal of Applied Behavior Analysis, 1, 91-97.

Barlow, D. H., & Hayes, S. C. (1979). Alternating treatments design: One strategy for comparing the effects of two treatments in a single behavior. Journal of Applied Behavior Analysis, 12, 199-210.

Beck, I. L., Omanson, R. C., & McKeown, M. G. (1982). An instructional redesign of reading lessons: Effects on comprehension. Reading Research Quarterly, 17, 462-481.

Beers, P. G. (1986). Accelerated reading for high school students. Journal of Reading, 29, 311-315.

Berkowitz, S. J. & Taylor, B. M. (1981). The effects of text type and familiarity on the nature of information recalled by readers. In M. Kamil (Ed.), Directions in reading: Research and instruction, (pp. 157-161). Washington, DC: The National Reading Conference.

Bridge, C. A., & Winograd, P. M. (1982). Reader's awareness of cohesive relationships during cloze comprehension. Journal of Reading Behavior, 14, 299-312.

Brown, D. A. (1982). Reading diagnosis and remediation. Englewood Cliffs, NJ: Prentice-Hall.

Chall, J. (1978). A decade of research on reading and learning disabilities. In S. J. Samuels (Ed.), What research has to say about reading instruction, (pp. 31-42). Newark, DE: International Reading Association.

Darch, C. B., Carnine, D. W., & Kameenui, E. J. (1986). The role of graphic organizers and social structure in content area instruction. Journal of Reading Behavior, 18, 275-296.

Diggs, V. M. (1973). The relative effectiveness of the SQ3R method, a mechanized approach and a combination method for teaching remedial reading to college freshmen. (Doctoral dissertation, West Virginia University, 1972). Dissertation Abstracts International, 33, 5964A.

Donald, S. M. (1967). The SQ3R method in grade seven. Journal of Reading, 11, 33-35; 43.

Douge, J. (1983). The effect of study skill training on the retelling of fourth, fifth, and sixth grade learning disabled students. Unpublished master's thesis, The Ohio State University, Columbus, OH.

Ekwell, E. E. & Shanker, J. L. (1983). Diagnosis and remediation of the disabled reader. Boston: Allyn & Bacon.

Fodim, M. (1986). Research papers the SQ3R way. Journal of Reading, 29, 550-552.

Fredericksen, J. R. (1981). Understanding anaphora: Rules used by readers in assigning pronominal referents. Discourse Processes, 4, 323-348.

Fry, E. (1977). Fry's readability graph - Clarifications, validity, and extension to level 17. Journal of Reading, 21, 242-252.

Grob, J. A. (1970). Reading rate and study-time demands on secondary students. Journal of Reading, 13, 285-288; 316.

Gurrola, S. (1975). Determination of the relative effectiveness and efficiency of selected combinations of SQ3R study method components. (Doctoral dissertation, New Mexico State University, 1974). Dissertation Abstracts International, 35, 6938A.

Harris, A. J. (1968). Research on some aspects of comprehension: Rate, flexibility, and study skills. Journal of Reading, 12, 205-210; 258-260.

Harris, A. J. & Sipay, E. R. (1980). How to increase reading ability (7th ed.). New York: Longman.

Haviland, S. C., & Clark, H. H. (1974). What's new? Acquiring new information as a process in comprehension. Journal of Verbal Learning and Verbal Behavior, 13, 512-521.

Heilman, A. W., Blair, T. R., & Rupley, W. H. (1986). Principles and practices of teaching reading. Columbus, OH: Merrill.

Herber, H. L. (1970). Teaching reading in content areas. Englewood Cliffs, NJ: Prentice-Hall.

Hersen, M., & Barlow, D. H. (1976). Single case experimental designs: Strategies for studying behavior change. Elmsford, NY: Pergamon.

Ip, W. H. (1986). A survey of the reading comprehension problems of learning disabled students. Unpublished master's thesis, The Ohio State University, Columbus, OH.

Johns, J. L., & McNamara, L. P. (1980). The SQ3R study technique: A forgotten research target. Journal of Reading, 33, 705-708.

Johnson, R.E., & Varidan, E. B. (1973). Reading, readability, and social studies. The Reading Teacher, 26, 483-488.

Johnston, J. M., & Pennypacker, H. S. (1980). Strategies and tactics of human behavioral research. Hillsdale, NJ: Erlbaum.

Kimmel, S., & MacGinitie, W. H. (1984). Identifying children who use a perservative text processing strategy. Reading Research Quarterly, 19, 162-172.

Kintsch, W., Mandel, T. S., & Koxminsky, E. (1977). Summarizing scrambled stories. Memory and Cognition, 5, 547-552.

McCormick, S. (1987). Remedial and clinical reading instruction. Columbus, OH: Merrill.

Pauk, W. (1965). Scholarly skills or gadgets. Journal of Reading, 8, 234-239.

Robinson, F. P. (1946). Effective study. New York: Harper & Brothers.

Sargent, E. E., Huus, H., & Andersen, O. (1970). How to read a book. Newark, DE: International Reading Association.

Schiffman, G. (1982). Solving the problems of territorial imperative: A truly interdisciplinary approach. Paper presented at the meeting of the International Reading Association, Chicago.

Tadlock, D. F. (1978). SQ3R--Why it works, based on an information processing theory of learning. Journal of Reading, 22, 110-112.

Tinker, M. A., & McCullough, C. M. (1968). Teaching elementary reading. New York: Appleton-Century-Crofts.

Vioux, R. G. (1968). Evaluating reading and study skills in the secondary classroom. Newark, DE: International Reading Association.

Wilmore, D. J. (1966). A comparison of four methods of studying a college textbook. (Doctoral dissertation, University of Minnesota, 1966). Dissertation Abstracts International, 27, 2413A-2414A.

Wooster, G. F. (1958). Teaching the SQ3R method of study: An investigation of the instructional approach. (Doctoral dissertation, The Ohio State University, 1958). Dissertation Abstracts International, 18, 2067A-2068A.

Appendices

APPENDIX A

Example of a 300-Word Passage

Read by Students

The Fight for Control of the Ohio River Valley

Two Countries Claim the Ohio Country

The first country to claim the Ohio area was France. Jacques Cartier discovered and sailed up the St. Lawrence River in 1535. He did not travel as far south as the Ohio Region. However he claimed all the land which drained into the St. Lawrence, naming the area New France. Etienne Brule, a French fur trader, is believed to be the first European to enter Ohio. The next people to arrive were the French missionaries and explorers.

The British colonized all along the Atlantic Coast. The first colony was established in 1607 at Jamestown, Virginia. The British settled inland as far as the Appalacian Mountains. The mountains prevented their entering the Ohio Valley until about 1740.

They began to hear reports about the beauty of the Ohio Valley. They also heard of the many animals whose pelts could be made into furs. The few scouting parties were sent to spy out the land returned with valuable furs and good reports.

The Intercolonial Wars

France and England wanted to own this land and control the Indian fur trades. The fur trade was very profitable. The countries fought in a series of wars which would decide the future of America. They were called the Intercolonial Wars.

By 1740, both sides were building their defenses. The English built a fort named Fort Sandusky near Lake Erie. A few people from Virginia started the Ohio Land Company. Their purpose was to establish a colony in the Ohio River Valley.

The French sent an agent, Celeron de Bienville, to Ohio to warn the

British to leave. He failed in his attempt to convince the Indians to side with the French. He also was unable to persuade the English to leave.

APPENDIX B

Example of an Information Units Sheet Used by the Teacher during Students' Retellings and during the Scoring of Students' Responses

Information Units

The Decline of the Slavery System

I. Slave Codes

1. Southern states passed laws
2. These laws were to keep control over the slaves
3. They were passed as the number of slaves increased
4. These laws were called slave codes
5. Owners were not allowed to free slaves
6. Slaves could not buy their own freedom
7. They could be put to death for taking part in slave revolts

II. Slave Resistance

8. Slavery was resisted in many ways
9. Organized revolts got the most publicity
10. But acts of resistance took place everyday
11. Slaves showed their hatred of the slave system in many ways
12. They worked slowly
13. They ruined tools and other property
14. They stole
15. They faked sickness
16. Slaves often ran away from their owners
17. Newspapers were filled with reward offers
18. The offers were for the return of runaway slaves
19. Most runaways were caught
20. Southerners guarded the roads
21. They tracked runaways with bloodhounds
22. One woman ran away
23. She hid in a cave for 7 years

24. Her husband brought her food
25. He was a slave on a nearby plantation
26. Most runaway slaves tried to reach northern states
27. They usually traveled at night
28. They used the stars to find their way north
29. After reaching the northern states, abolitionists would help the slaves move from one safe place to another
30. They helped the slaves reach Canada
31. They had the "underground railroad"
32. These were the routes the slaves followed to Canada
33. Some Southerners also helped move the runaway slaves

III. Slave Revolts

34. Slave resistance sometimes took the form of violence
35. White Southerners lived in fear of slave revolts
36. They remembered the slave uprising on Haiti
37. The Haiti uprising was successful
38. They knew many slaves wanted freedom
39. One reason for the slave codes was to guard against revolts
40. The laws were harsh
41. In spite of the laws, revolts broke out

APPENDIX C

Example of a Schemata Statement Used in Study 4

THE END OF THE FRONTIER

In the 1860's people who lived in the West were very isolated. They had come to the area as pioneers, traveling in covered wagons drawn by horses, oxen, or mules. They usually traveled in groups of wagon trains. The wagon train offered safety and protection from the Indians and the climate. After establishing communities and towns, the Westerners wanted contact with the East. The East could provide equipment, furniture, and other items that the West needed. The problem was that horse-drawn vehicles could not adequately provide for the needs of the West. In today's passage, you will be reading about a solution to this problem.

APPENDIX D

Checklist Used

in Preparing Schemata Statements

Checklist for Schemata Statements

1. Your name: _____
2. Name of passage: _____
3. Exact number of words in schemata statements (minus title): _____
4. Did not include information that is in the passage (you should be able to check "did not")

   Did Not _____ Did _____
5. Persons involved (write who) _____
6. Time _____
7. Place _____
8. Problem _____

   _____

   _____

   _____
9. How you ended schemata statement:

   _____ indicating resolution would be specified in passage

   or

   _____ asking a reasoning type question

   or

   _____ giving directions to read for specific information
10. Important background provided? _____Yes _____No
11. Captures interest? _____Yes _____ No

APPENDIX E

Prediction Questions Used in Study 4

PREDICTION QUESTIONS

SLAVERY SPLITS THE COUNTRY

1. In the early years of our country, many Americans believed that the system of slavery would end eventually. How did they think this would happen?

2. After about 1830, Southerners' attitudes toward slavery changed. What was the new attitude?

WORLD WAR I

1. What European countries fought in World War I? (Try to name at least 3.)

2. What was the attitude of people in the United States toward the war in Europe when it first started?

3. What caused the United States to enter World War I?

THE OHIO REGION PREPARES TO BECOME A STATE

1. Why do you think a stronger government was needed in the Northwest Territory at the time the Ohio region was preparing to become a state?

2. The Governor of the Territory, St. Clair, moved the capital to a town called Losantiville and changed its name. What Ohio city used to be called Losantiville?

3. Governor St. Clair did not support the Northwest Territory's plans to become a state. Why do you think he didn't?

THE GREAT DEPRESSION

1. Why did a terrible depression hit the United States in 1929?

2. What did President Hoover do to help end the Depression?

CHANGES IN FARM PRODUCTION

1. What did the small farms in the 1840's supply for farm families besides their food?

2. What improvements were made in plows?

THE INDIANS RESIST WESTERN SETTLEMENT

1. In the battles between the Indians and the early American settlers, who usually won and why?

2. How did the U.S. government persuade the Indians to move into the territory the government has set aside for them?

FRANKLIN D. ROOSEVELT

1. How did President Roosevelt's family background contribute to his self-confidence?

2. What personal characteristics made Roosevelt a successful politician?

THE PROSPEROUS TWENTIES

1. What major adjustment do you think industries might have to have made in the 1920's after World War I had ended?

2. In the new automobile industry, can you guess what car was in a price range most people could afford?

3. How did the fact that more people began to own cars affect the housing industry?

4. Why do people buy stock or shares in a company?

THE DECLINE OF THE SLAVERY SYSTEM

1. What do you think "slave codes" were?

2. Can you guess some of the ways the slaves resisted the slavery system?

3. What do you think white southerners did to prevent slave revolts?

THE NEED FOR DAMS IN OHIO

1. What do you think caused flooding in Ohio?

2. How do you think the growth of cities contributed to the problem of flooding?

SOUTHERN SOCIETY

1. In what ways do you think the planters, that is, the plantation owners, and farmers were different?

2. Why do you think the city dwellers were interested in the plantations?
3. How were some slaves able to become free blacks?

FIGHTING FOR THE OHIO VALLEY

1. In which direction do you think the soldiers tried to push the Indians?
2. What do you think President Washington asked Congress to do to help the army?
3. Why do you think General Wayne was nicknamed "Mad Anthony"?

THE STRUGGLE OF EARLY EUROPEANS

1. How do you think serfs were different than free farmers?
2. What do you think the Crusades were?

THE SEARCH FOR A NEW ROUTE TO ASIA

1. Why do you think a sea route was more desirable than the land route to Asia?
2. What do you think was Christopher Columbus' plan?

LIVING IN THE SOUTHERN COLONIES

1. What crops do you think were grown in the South back in the colonial days?
2. How do you think the plantations were like cities?
3. How do you think children in the South were educated?

THE END OF THE FRONTIER

1. Before the railroads were built, what do you think were ways people and goods were transported?
2. How do you think the West was linked with the eastern railroad?

CHRISTOPHER GIST IN THE OHIO RIVER VALLEY

1. What do you think happened when Gist met the Indians?
2. Why do you think Gist came to the Ohio River Valley?

THE LOG CABIN CAMPAIGN

1. What caused the panic of 1837?
2. What do you think "Tippecanoe & Tyler Too" means?
3. Which campaigning party met in Ohio?

AFTER THE CIVIL WAR WAS OVER

1. What happened to shock the U.S. in April 1865?
2. What two things were settled as a result of the Civil War?
3. What do you think it was like for the returning Confederates?

THE NORTHWEST TERRITORY

1. Why were states fighting after the Revolutionary War?
2. How did Congress deal with the land problem?

GERALD FORD IN THE WHITE HOUSE

1. How was Ford prepared for the job of President?
2. Who was approved for the position of Vice President under Ford?

MIDDLETOWN GROWS

1. Where do you think this new town was?
2. What sort of products were processed by the mills in Middletown?

INDIANS OF THE WEST

1. What sort of life did the Plains Indians lead?
2. What caused the Indians to resist the white men?

EXPLORERS FIND A NEW WORLD BLOCKING THE WESTWARD ROUTE TO ASIA

1. How did people react to Columbus' discovery? (Why?)
2. Why didn't Cabot get to the Americas before Columbus?

SOME NATIVE CULTURES OF THE AMERICAS

1. What does this mean -- "an old world"?
2. Besides Indians, who were the Native Americans?
3. How did these people adapt to their surroundings?

MAKING A LIVING IN NEW ENGLAND

1. The passage takes place during colonial times. How many people do you think worked on the land then?
2. How do you think they used the geography of the land?

TRANSPORTATION IN EARLY OHIO

1. What did they use rivers for in early Ohio?
2. Can you guess what one improvement in river travel was?
3. Why were roadways not as useful as rivers?

MAKING THE NEW GOVERNMENT WORK

1. What was it like to be the first President?
2. What were some of the problems to be solved?

THE RIVERMEN

1. This passage takes place back in the 1800's. What kinds of boats did they use "back then"?
2. What do you think a keel boat was like?
3. What do you think the men were like who worked on these boats?

PIONEERS COME TO THE OHIO COUNTRY

1. What was one difficulty the pioneers faced in turning the wilderness into settlements?
2. How did the early Ohio settlers get here from the Eastern part of the country?

SCHOOLS IN EARLY OHIO HISTORY

1. Public education in Ohio was established as part of the Land Ordinance of 1785. How do you think this law said that schools should be paid for?
2. What kind of training did teachers of the early schools receive?

THE SETTLING OF SOUTHERN OHIO

1. How do you think the land company enticed people to settle in southern Ohio?
2. How many people do you think first came to settle the land near the mouth of the Little Miami River? Take a guess!

APPENDIX F

Example of a Baseline Teaching Script Used in One of the Studies

BASELINE TEACHING SCRIPT

I. On the first day of baseline remind the students that the entire session is recorded and why.

II. Start the retelling tape recorder. This should run the entire period.

III. Say DATE, DAY, "Order of Retelling", and give name of passage.

IV. Check whether tape is a 60 or 90-minute tape. If it is a 60-minute tape, set timer for about 28 minutes so you can turn the tape over. Under normal circumstances you will not have to turn over the 90 minute tape as the period should be 45 minutes. However, the timer should be set in case the reciting runs longer than 45 minutes.

V. VOCABULARY WORDS

A. Show one vocabulary card and choose one student to pronounce it.
If the student cannot pronounce the word the teacher will do so.
Teacher briefly explains the meaning of the word.
Do the same with each card, calling on a different student each time.
Since there will be three students, each should pronounce one word.

B. Ask each student to pronounce all three words; assist if necessary.

VI. PASSAGES

A. Handout passages.

B. SQ3R - none since this is baseline.

C. Proceed with below.

BASELINE TEACHING SCRIPT (cont.)

STEP 1 The teacher must follow this entire script exactly! Say:

a. "Read and study this passage the best way you can."

b. "You have 15 minutes."

c. "Then, I'll stop you and ask each of you, one at a time, to tell me everything you can remember reading."

d. "The students who are not retelling will listen to music with the earphones and may read the magazines."

e. "I'll call you to retell in the order listed on the posted sheet." (Indicate list)

f. On the first day briefly explain that the order will rotate every day.

g. "If while reading you come to a word you don't know, please ask me."

STEP 2 When the 15 minutes have passed collect all passages.

STEP 3: Have first student listed on "Order of Retelling" sheet move to retelling tape recorder. Arrange recorder so that the built-in microphone will pick up his voice. It is best to have him facing the mike and the recorder positioned away from the other students.

Have the other students put on earphones, select a magazine, listen to music, and read. Be sure the students have the music playing before you begin with the student who is retelling.

BASELINE TEACHING SCRIPT (cont.)

V. RETELLING

-Have Information Units Sheet for the student attached to the clipboard.

-During retelling, hold clipboard so that student cannot see it.

-Mark off units told on the left side of the sheet. Example:

THE GOLD RUSH

1. Early days in Alaska

✓1. There were miners in Alaska

2. They were looking for gold

✓3. Gold was not easily found

A. Into retelling tape recorder say:

1. Name of the passage
2. Name of the student
3. Whether student is the 1st, 2nd, or 3rd reader

B. The teacher says:

a. "Tell me everything you can remember reading."

b. "I won't interrupt you, so tell me as much as you can before you stop."

c. "Remember, you'll get a point for every important detail you can recall."

d. "You can begin now."

BASELINE TEACHING SCRIPT

C. When the student stops, say, "Can you think of anything else?"

1. If "Yes", ask to continue.
2. If "No", thank the student and conduct the reinforcement procedure.

VI. REINFORCEMENT PROCEDURE

A. Immediately after each student retells, show him the Information Units Sheet and together count the number of units recalled.

B. Quickly figure the percentage of units correctly recalled. (Divide the larger number into the smaller).

C. Open that student's folder and take out the graph.
-Show him how to plot the percentage, have him mark it, and connect the dot to the previous scores.
-Do this immediately and have the student do his own graphing.

D. If his score is higher than the previous day, make a positive, praising statement.
If his score is lower, make an encouraging comment, e.g., "Tomorrow we'll try to better your score."

Have the student change places at the earphones with the next student and repeat Retelling and Reinforcement procedures until all three have retold. If there is any extra time, allow the students to read and talk.

APPENDIX G

Example of an Intervention Teaching Script Used in One of the Studies

Intervention Teaching

Script

Study 1

I. Start retelling tape recorder. (Remember: this should run all period). SAY DAY and DATE into tape recorder.

II. Start kitchen timer. (This is to tell you when you must turn tape to other side.)

III. Hand each student his point card. Award reinforcers, if appropriate.

IV. WORDS

A. Show one card; ask one student to pronounce. (If he cannot, teacher pronounces.) Teacher briefly says meaning. Do same with each card, calling on a different student each time.

B. Ask each student to pronounce ALL words; assist if necessary.

V. PASSAGES (SQ3R)

A. Hand out passages.

B. Say, "We're going to use a special study technique called SQ3R to work on the passages today."

C. (Point to the SQ3R CHART you already have posted.) Say "The S means Survey. To survey means to read the title and all of the subheads to get an idea of what the passage is going to be about. Let's do that."

. (Call on someone to read the title. Assist if necessary).

. (Call on different students to read the subheads -- one each, etc. Assist if necessary.) (Also, quickly help them recognize what a subhead is, if necessary.)

D. Say, "Look back at the chart." (Point to it). "The Q means Question. This means to turn the title and subheads into questions. This helps you know what important details to look for. I'll do the title for you."

.Tchr: (Turns title into a question.)

.Tchr: (Calls on students to turn each subhead into a question. Assists, if necessary.)

E. Say, "Look at the chart again. The first R means Read, so I'm going to give you 10 minutes to read the passage silently. Begin now. If you come to a word you don't know, ask me." (Teacher should read passage, too, to get ready for the recite step.)

F. After 10 minutes, say: "Look back at the chart. The next R stands for Recite. This means to say out loud or to yourself the details you found under each subhead. Let's see what you can remember without looking. Turn the passage over."

.Tchr: Read first subhead to group. Call on one person to recite all details he can remember.

.Tchr: Tell all students to look at the section under that subhead and tell you if anything important was forgotten.

.Tchr: Do the same with subhead #2, #3, etc.

G. Say: "Now look at the chart one more time. The last R stands for Review. This means to silently read each subhead and without looking at what's in that section, silently try to say to yourself the important details. After you read each subhead, cover that section with your hand and see how many you can remember. Then, look at the section and see if you forgot anything important. Do the same with each subhead until you're done. I'll give you 3 minutes to review, then we'll retell and see how many details you can remember today."

H. After 3 minutes, collect the passages.

I. Have first student listed on "Order of Retelling" sheet move to tape recorder for retelling. Have other students put on earphones, select magazine, listen to music, and read.

VI. RETELLING

A. Into retelling tape recorder, say:

1. Name of passage
2. Name of student

B. Say: "(a) Tell me everything you can remember reading. (b) I won't interrupt so tell as much as you can before you stop. (c) Remember, you'll get a point for every important detail you can tell. (d) You can begin now."

C. When student stops, say "Can you think of anything else?"

1. If "Yes," ask to continue.
2. If "No," thank student and have him go to other tape recorder and listen to music (with earphones) and look at a magazine.

(I.e., student will have two opportunities to retell -- the original prompt and one additional when you say "Can you think of anything else?")

D. Call on next student and conduct the procedures until all four students have retold.

VII. Turn off tape recorder.

VIII. If, time is left before period is over:

A. Continue with music and magazines.

or

B. Chat with the students.

APPENDIX H

An Example of Directions for the Reliability Check on the Dependent Variable

Study #5

Reliability Check for DEPENDENT Variable

1. Reliability checker will check 1 student per group each day (i.e., 1 from Class #1, 1 from Class #2, 1 from Class #3) for a total of three students per session (out of 9 students).
2. It is estimated that listening to each student's retelling = 10-15 min. x 3 students = 30-45 min./day.
3. Chart titled "Randomized List of Students for Reliability Check" will be used to indicate which students will be listened to each day. A randomization procedure has been employed already to select each student from each class each day. Refer to this chart EACH day. Teachers (GRAs) will not know which student will be checked, (i.e., the chart will go only to the reliability checker and the project directors).
4. Materials needed by reliability checker.*
   a. 3 charts labeled "Randomized List of Students for Reliability Checks" (one each for Class #1, #2, #3)
   b. 3 tapes (one each for Class #1, #2, & #3) (Found in passage folder)
   c. Tape recorder
   d. Information Units Sheet (You will find photocopies of these in the folder where you found the passage.) You will need 1 of these for each student you check that day.
   e. Pen or pencil
   f. Paper clip
   g. Chart titled: "DEPENDENT Variable Reliability Check: What has been done" - 1 copy.

h. Information Units Calculation Form (This is already stapled to each of the Information Units sheets).

5. Procedures for reliability checker:

a. Consult the 3 charts labeled "Reliability of DEPENDENT VARIABLE. (There's one for Class #1, Class #2, & Class #3).

b. Note the name of the passages used that day. (Consult chart on wall because this can vary by teacher!)

c. Go to file drawer labeled "Passages," find the folders, and remove the 3 tapes (one for Class #1, Class #2, & Class #3).

d. Use tape recorder and listen to one student from each tape. To determine which student to listen to from each class tape, consult chart "Randomized List of Students for Reliability Check" for that class.

e. As you listen, use Information Units Sheet and mark off all details student tells.

f. Complete information requested on this form, including calculation of percentage. (To calculate percentage, divide the big number into the small number)

g. Put tapes back in passage folder.

h. Paper clip all forms together and attach a note saying "Day _____." (1, 2, etc.).

i. Give to Dr. McCormick. Ask her the exact place you should put these.

f. Each day Dr. McCormick will check the percentage you obtained for each student against the percentage plotted on the student's graph by the teacher of that class (one of the project GRAs). This graph is in each student's individual manila folder in the front of the

passage drawer, the reliability checker (you) should not look at this graph.

IT IS IMPORTANT THAT RELIABILITY CHECKS BE DONE NO LATER THAN ONE DAY AFTER GRA's HAVE COLLECTED THE DATA.

After Dr. McCormick has checked the reliability checker's results with those of the teacher's (GRA's), if there is a disagreement you must meet with the teacher to resolve the differences.

APPENDIX I

An Example of Directions for the Reliability Check on the Independent Variable

Study #5

Reliability of the INDEPENDENT Variable

1. On the first day of BASELINE 1 the reliability checker will listen to the entire tape for all 3 classes. Estimated listening time is 50 minutes per tape (3 x 50 min. = 150 min.). On the 1st day any teacher conducts INTERVENTION 1 the first time, listen to her tape.
2. On all other days, the reliability checker will listen to only one of the 3 tapes. To determine which tape to listen to, refer to the "Table of Random Class Selection for INDEPENDENT Variable Reliability Check."
3. While listening to the tape, use either the "Checklist for Baseline" OR "Checklist for Intervention."
   a. Obtain the tape(s) from the passage folder. You'll know which passage because you will have determined that for the reliability check for the DEPENDENT variable.
   b. While you listen, check off the items that the teacher completed.
   c. When done, if any items are not checked off, tell Dr. McCormick or Dr. Cooper that day. Also, talk with the teacher.
   d. Give the checklist(s) to Dr. McCormick when completed.

APPENDIX J

Example of a Checklist Used by the Independent Observer for Assessing Reliability of the Independent Variable

Study #2

Reliability of Independent Variable

Checklist for Baseline, Condition 1, & Condition 2

1. Teacher said day and date into tape recorder.
2. Teacher handed out passages.
3. Teacher said: "We're going to use a special study technique called SQ3R to work on the passages today."
4. (After pointing to a chart) teacher said: "The S means Survey. To survey means to read the title and all of the subheads to get an idea of what the passage is going to be about. Let's do that."
5. Teacher: Called on someone to read the title. (Assisted if necessary).
6. Teacher: Called on different students to read the subheads - - one each, etc. Assisted if necessary. (Also, quickly helped them to recognize what a subhead is, if necessary.)
7. Teacher said: "Look back at the chart." "The Q means Question. This means to turn the title and subheads into questions. This helps you know the important details to look for. I'll do the title for you."
8. Teacher: Turned title into a question.
9. Teacher: Called on students to turn each subhead into a question. (Assisted, if necessary.)

10. Teacher said: "Look at the chart again. The first R means Read, so I'm going to give you 10 minutes to read the passage silently. Begin now. If you come to a word you don't know, ask me." (Gives 4 min. if condition 2 or 3).
11. After 10 minutes, teacher said: "Look back at the chart. The next R stands for Recite. This means to say out loud or to yourself the details you found under each subhead. Let's see what you can remember without looking. Turn the passage over." (After 4 min. if condition 2 or 3)
12. Teacher: Read first subhead to group. Called on one person to recite all details he could remember.
13. Teacher: Told all students to look at the section under that subhead and tell her if anything important was forgotten.
14. Students: Gave ideas that were forgotten.
15. Teacher: did #20, 21, 22 above for ALL subheads in passage.
16. Teacher said: "Now look at the chart one more time. The last R stands for Review. This means to silently read each subhead and without looking at what's in that section, silently try to say to yourself the important details. After you read each subhead, cover that section with your hand and see how many you can remember. Then, look at the section and see if you forgot anything important. Do the same with each subhead until you're done. I'll give you 3 minutes to review, then we'll retell and see how many details you can remember today."

17. Teacher: After 3 minutes, teacher collects the passages.
18. Teacher directs one student to move to tape recorder for retelling.
19. Teacher had other students put on earphones, select magazine, and listen to music and read.
20. Teacher says into tape recorder: name of passage.
21. Teacher says into tape recorder: name of student.
22. Teacher says:
    a. "Tell me everything you can remember."
    b. "I won t interrupt so tell as much as you can before you stop."
    c. "Remember, you'll get a point for every important detail you can tell."
    d. "You can begin now."
23. When student stops, teacher said, "Can you think of anything else?"
    1. If "Yes", asked student to continue.
    2. If "No", thanked student and had him go to tape recorder and listen to music (with earphones) and look at magazine.

       (I.e. student will have had 2 opportunities to retell -- the original prompt and one additional when teacher said "Can you think of anything else?")
24. Immediately after student finishes retelling, teacher informs student of number of points he earned.

25. Teacher helps student plot data point on his personal graph.

26. Teacher:

    a. Makes positive comment (if score is higher than day before)

    OR

    b. Makes encouraging comment (if score is same as day before or lower) . . . e.g., "Tomorrow let's try to better your score."

27. With 2nd student, teacher did #21 above.

28. With 2nd student, teacher did #22 above.

    part a -

    part b -

    part c -

    part d -

29. With 2nd student, teacher did #23.

30. With 2nd student, teacher did #24.

31. With 2nd student, teacher did #25.

32. With 2nd student, teacher did #26.

33. With 3rd student. teacher did #21 above.

34. With 3rd student, teacher did #22 above,

    part a -

    part b -

    part c -

    part d -

35. with 3rd student, teacher did #23.

36. With 3rd student, teacher did #24.

37. With 3rd student, teacher did #25.

38. With 3rd student, teacher did #26.
39. With 4th student, teacher did #21 above.
40. With 4th student, teacher did #22 above,
    part a -
    part b -
    part c -
    part d -
41. With 4th student, teacher did #23.
42. With 4th student, teacher did #24.
43. With 4th student, teacher did #25.
44. With 4th student, teacher did #26.
45. Teacher turns off tape recorder.

CEC

FINAL REPORT CERTIFICATION FORM

GRANT NUMBER: G008530194

INSTITUTION: Ohio State University
Research Foundation
Columbus, OH 43212

PRINCIPAL INVESTIGATOR: Sandra McComick
John O. Cooper

COMPETITION: Field Initiated Research FY 1985

REVIEWER: Doris Cargile

TITLE: Investigation of a Study Technique to Increase Learning Disabled Students' Reading Comprehension of Expository Text

SUMMARY OF FINAL REPORT

Purpose

The purpose of this project was to conduct a series of six experiments designed to provide a more in-depth understanding about whether SQ3R is a helpful reading study skill technique for secondary students with learning disabilities. SQ3R stands for the following: Survey (to scan titles, subtitles). Question (to change titles into questions); Read (to read actively); Recite (to answer the questions posed in step 2); and Review (to answer the questions posed in step 2 again after a lapse of time). Study 1 was a replication of previous experiments (Alexander (1985) and Doug (1983)) that had shown functional relationships between the introduction of the SQ3R technique and reading comprehension of elementary pupils. Findings from Study 1 did not substantiate the findings of the previous experiments. Therefore, the objectives of the remaining five studies in this project focused on identifying robust variables to be added to or to find variations of the SQ3R technique for secondary students with learning handicaps in reading.

Methods

General procedures for all experiments consisted of students retelling information after reading passages from history texts. Percentages of retelling were computed from the number of information units contained in a passage. Interrater agreement measures were taken for both the dependent and independent variables. Each experiment lasted approximately 10 weeks. Nine or ten different subjects were used in each experiment and were all classified as learning disabled according to State of Ohio criteria. Data for the six experiments were analyzed through use of single-case experimental designs.

Results

SQ3R was originally designed as an independent study system. However, this project investigated the efficacy of SQ3R in teacher-directed lessons as a first step before studying its effectiveness when students read and study alone. The

results of this project provide little support for the use of SQ3R with students who are learning disabled. Even with direct teacher instruction throughout the lessons, in none of the six experiments was SQ3R much more helpful than instructional study in which students were simply told to "read and study this passage the best way you know how." However, there was a clear functional relationship between the length of passages used and the recall of information. When students were assessed after 300-word passages (there was less text with which to contend than in the 1,000 word selections), their comprehension scores were higher. The opportunity to stop after a relatively short reading session to report ideas gained may present an easier task for students with learning disabilities than remembering complicated relationships running across lengthier pieces of prose.

Implications

One implication is that teachers of secondary students with learning disabilities frequently intersperse discussions within the reading of longer expository material. This in turn implies direct teacher instruction for these students rather than independent reading of content area books. A second implication is that publishers develop content area texts specifically for students who have reading difficulties by integrating discussion questions at short intervals throughout the text rather than after longer portions of text, such as at the end of chapters.

Recommendation

The final report should be accepted in its current form and made available to interested individuals through ERIC.